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Douglas R. Collicutt. 1979.

A Resource Inventory of the Mantagao Lake Wildlife Management Area.

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DEPARTMENT OF NATURAL RESOURCES
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A resource inventory of the Mantagao Lake Wildlife Management Area.

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ABSTRACT

A resource inventory of the Mantagao Wildlife Management Area was conducted during the spring and summer of 1979. Over 300 plants, 25 mammals, 150 birds, 3 reptiles and 5 amphibians were identified. The red-bellied snake (Storeria occipitomaculata), plains garter snake (Thamnophis radix) and grey-tree frog (Hyla sp.) observations represent new northern records for the Interlake region of Manitoba.

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INTRODUCTION

The Wildlife Branch of the Department of Natural Resources is responsible for the development, operation and management of Manitoba's Wildlife Management Areas (WMA's). Effective planning and delivery of the WMA program requires access to accurate resource information. This study was undertaken to identify the floral and faunal resources within the Mantagao Lake WMA.

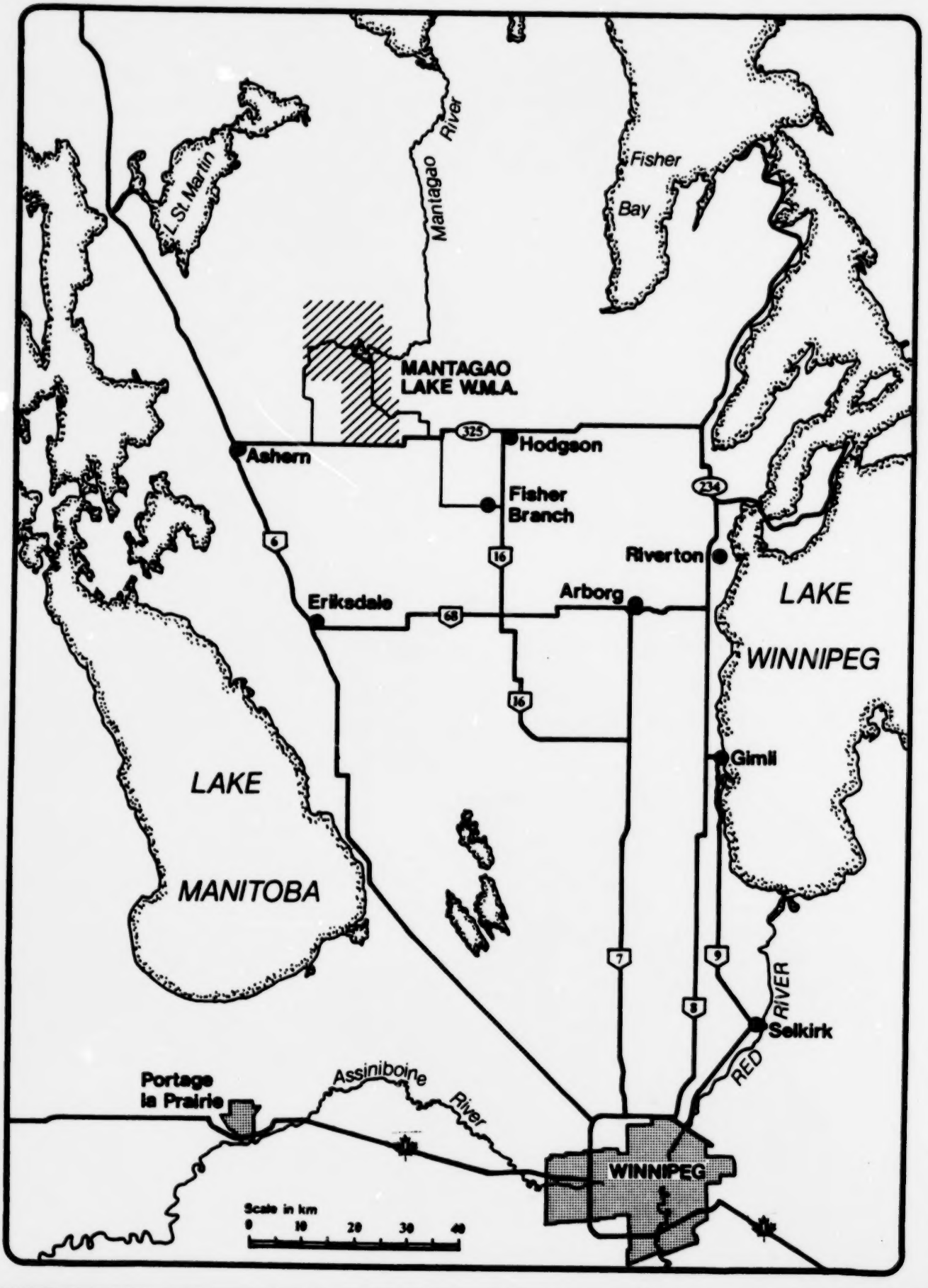
Resource information contained in this document is based upon field studies conducted during spring and summer 1979 (May 23 to August 23). Time restraints restricted the study to cursory examinations of specific components of the resource base. However, these data should prove useful as a base for a continuing inventory of resources within the Mantagao WMA.

STUDY AREA

Mantagao Lake Wildlife Management Area (WMA) is in Manitoba's central Interlake, 150 kilometers north of Winnipeg. Located between Ashern and Hodgson and north of PTH 325, it is 475 square kilometers in area (Fig. 1). Mantagao's diversity of habitats were incorporated into a WMA in 1968 primarily for ungulate management.

The Mantagao Lake area is underlain by Silurian-aged limestone. This is usually covered by deposits of loamy, water-worked moraines (Zoltoi 1975). Moraines typically contain large concentrations of stones, evident in nearby cultivated fields.

Local topography is generally flat to gently undulating with a few noticeable gravel ridges. These ridges are located in the southeast and northwest portions of the WMA. Branches of these ridges form the base for the area's internal network of roads and trails. Drainage varies from good


L. St. Martin
Manigagao River
Fisher Bay
MANTAGAO LAKE W.M.A.
325
Hodgson
Ashern
Fisher Branch
234
6
16
Riverton
Arborg
Eriksdale
68
LAKE WINNIPEG
16
Gimli
LAKE MANITOBA
7
9
8
RED RIVER
Selkirk
Portage la Prairie
Assiniboine River
WINNIPEG
Scale in km
0 10 20 30 40

in the area's southern and eastern sections, to poor in the northwestern portion. Local topography influences soil moisture conditions. Elevation drops of a meter commonly feature a transition from zeric jack pine communities to bogs.

Predominant plant communities iclude aspen, black spruce and jack pine forests on the better drained sites, with sedge marshes, fens and spruce bogs dominating the wetter areas. Local terrain and moisture conditions have produced an integration of mixed cover stands over large segments of the area.

Fire has played an important role in age and species distribution of plant communities. Virtually all of Mantagao WMA has burned at least once since 1948. Major fires in 1948 and 1963 blackened nearly all of the area. These burns contributed to the heterogeneity of the area's forest age classes. Isolated white spruce over 25 meters tall and 0.5-1 meter in diameter can still be found in the area. These trees are remnants of forest climax, largely destroyed by fire and logging practices. The white spruce climax will not likely re-establish in the area without logging curtailment and effective fire suppression.

METHODS

Basic inventory data were assembled from observations of individual plants while animal presence was determined from chance observation, trapline catches and other visible signs. Major habitats were investigated to enumerate resident floral and faunal species. Quantified data were collected from a bird census plot, small mammal trapping, and from quadrat analysis in various vegetative communities.

Equipment for special projects included a 4.8 meter canoe, a 25X power spotting scope, 8 x 40 binoculars, a haga altimeter, plant presses, compasses and numerous identification keys.

Quantified Plant Analysis

The following standardized quadrat techniques were used to quantitatively analyze tree, shrub and ground cover. (Deviations from this procedure are described in the text when applicable). Tabulated results of all vegetation plots are contained in Appendix I with locations indicated on Fig. 2.

In treed areas, square quadrats 10 meters on a side were randomly selected. The circumference of each tree within a quadrat was recorded at a height of 1.2 meters. The total height of each tree was also estimated. Diameter size classes for trees follows:

A. 2.0-4.9 cm.	D. 15.0-19.9 cm.
B. 5.0-9.9 cm.	E. 20.0-29.9 cm.
C. 10.0-14.9 cm.	F. 30.0-49.5 cm.

Basal area classes corresponding to average basal areas for each diameter class are:

A.	.009 $m^2/100\ m^2$	D.	.24 $m^2/100\ m^2$
B.	.043 $m^2/100\ m^2$	E.	.48 $m^2/100\ m^2$
C.	.12 $m^2/100\ m^2$	F.	1.24 $m^2/100\ m^2$

Shrub stems were counted in a two-meter wide strip along the south baseline of each plot.

Relative cover of ground and canopy were estimated using an occular tube held perpendicular to the ground. Cross-threads served as a sighting point. Vegetation was either present or absent depending upon whether it cut the cross-hairs. Twenty sightings, up and down, were used to estimate the relative degree of canopy closure and ground cover in each plot.

Ground vegetation was analyzed using $1m^2$ quadrats. Five quadrats were chosen randomly within each $10m^2$ plot. All identified species were recorded and a cover class assigned to each species for all the quadrats. (Not all plants were identified to species). Cover classes, according to a modifed Daubenmire (1909) scale, representing percent of ground cover, follows:

Cover Class	Range of Cover (%)
0	trace
1	1-5
2	5-25
3	25-50
4	50-75
5	75-95
6	95-100

In open, untreed areas a random series of $1m^2$ quadrats were established to determine ground vegetation. Shrub stems were recorded if present.

A collection of all plant species encountered was made. Small plants were pressed whole, usually while in flower; only flowers and twigs of larger plants were preserved. Habitat and site location were recorded for each specimen. Plants were tentatively identified, then sent to the Manitoba Museum of Man and Nature for verification and permanent storage. Flowering dates for each species were compiled from the first observed flowering date until last observed in flower. Plant names and order of presentation are after Scoggan (1957) as compiled by Dr. Karen Johnson.

Mammal Surveys

Museum Special Snap Traps were set out in various habitat types. Traps were set 10 meters apart in lines of various length according to location. Lines were run from two to three nights each. Study skins of a representative sample of each species were prepared and donated to the Manitoba Museum of Man and Nature. For each specimen, sex, age and species and catch site habitat were described.

The list of mammals contains only those species which were identified during the study. No references to other reports are made. Observations made by individuals not on the study team were noted, but not included in this document. Scientific and common names follow Banfield (1977).

Bird Studies

Bird surveys included the construction of a standard 16 hectare songbird plot, six road censuses of 5-19 kilometers with five minute stops each kilometer, and waterfowl breeding pair counts. See Appendix II for plot census results, Appendix III for road census results, and Appendix IV for waterfowl results. The annotated list of birds compiled from a season's

observation follows the fifth edition of the "Check-list of North American birds" (A.O.U. 1957) and the thirty-third supplement (1973).

Amphibians and Reptiles

Amphibian and reptile observations were made largely incidental to other activities in the WMA. Scientific names of amphibians and reptiles are according to Conant (1958).

RESULTS

Plant Communities

Jack Pine Plant Plots 1-5, July 16-17, 1979

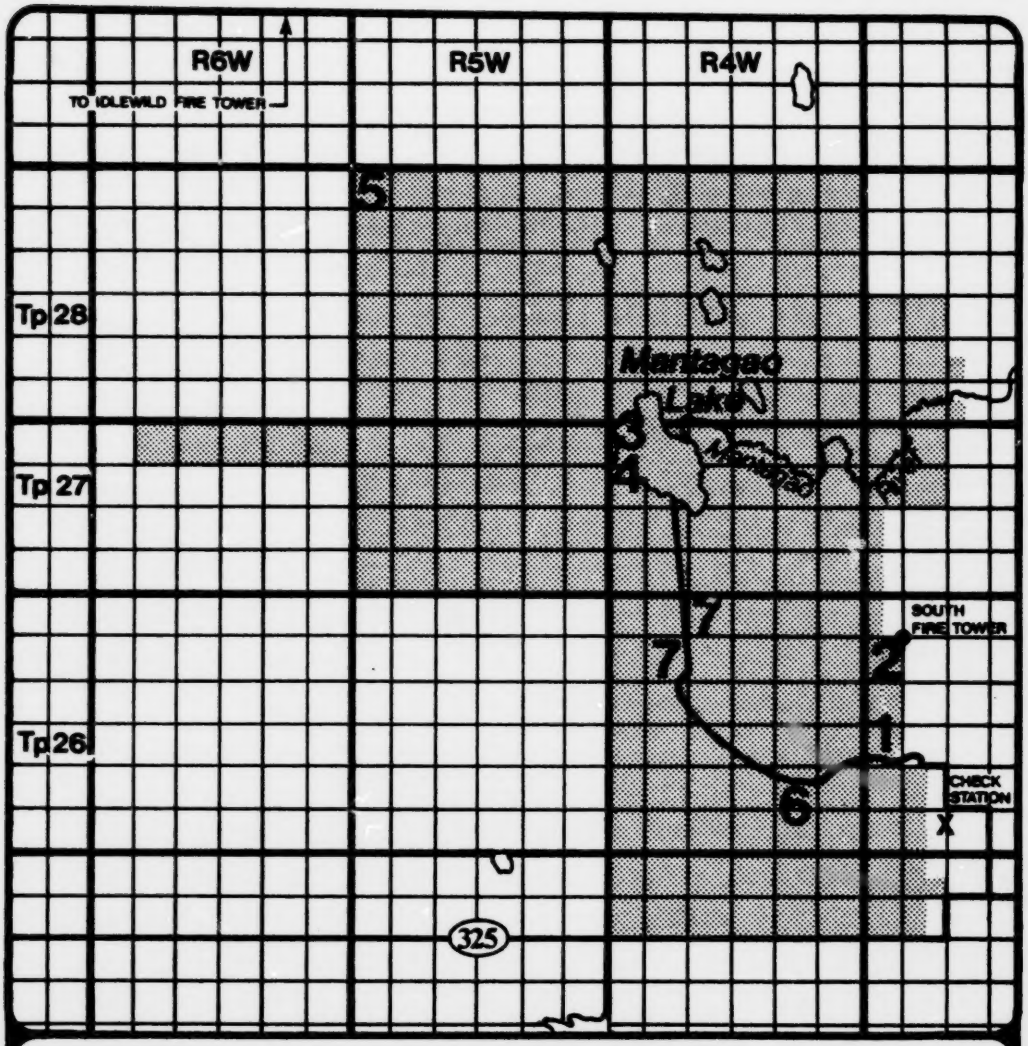
Five Survey plots were established in a mature jack pine stand located on a ridge along the road to the Mantagao River (Map 2). The stand was representative of those following the ridge which nearly spans the Wildlife Management Area from east to west. The understory was typically open with scattered shrub patches (Appendix I). Beaked hazel and buffaloberry dominated the shrub zone while twinflower, bunchberry, dewberry and bearberry were the most common ground cover species. Jack pines 13.6 meters in height dominated the canopy, which shaded just over 50% of the area's surface.

Five Dry Meadow and Five Dry Meadow Border Plots, August 21, 1979

Plots were located in a field along the road to the southern firetower (Fig. 2). These fields typically contained scattered scrubby oaks and jack pines and were bordered by aspen stands. Shrubs were typically scattered and low (Appendix I). The change from field to surrounding trees was usually abrupt (Appendix I). Open areas were dominated by grasses, bearberry and low Saskatoon bushes, while the field border had a variety of low shrubs over a ground cover dominated by bearberry and rose.

Two Mantagao Lakeside Vegetation Plots from August 16, 1979

The plots were located approximately 50 meters north of the campsite on the west side of Mantagao Lake (Fig. 2). They represented a stand of aspen, oak, birch and ash trees. The shrub layer was sparse with grass, dandelions and strawberry dominating the ground cover (Appendix I). This site quickly graded into dense aspen away from the lakeshore.



MANTAGAO LAKE WILDLIFE MANAGEMENT AREA

Scale in km
0 5 10

VEGETATION PLOT LOCATIONS

1 JACK PINE
2 DRY MEADOW AND DRY MEADOW BORDER
3 LAKESIDE
4 LAKE RIDGE
5 BLACK SPRUCE BOG
6 MATURE ASPEN STAND
7 MANTAGAO LAKE ROAD PLOTS

Lake Ridge Plot, August 16, 1979

The plot was located on the lake ridge just south of the road, in the campsite along the west side of Mantagao Lake (Fig. 2). It was approximately 10 meters wide and elevated two meters with virtually no shrubs. Balsam poplar dominated the trees while grasses covered the ground (Appendix I). Behind the ridge was a long, narrow meadow. The plot consisted of eight, $1m^2$, ground cover quadrats and 200 square meters of tree counts. No shrub or canopy closure results were obtained.

Black Spruce Bog, August 9, Three Plots

Plots were tabulated in the bog just east of where Idlewilde Road existed in the area (Fig. 2). The three plots were done in treed, semi-open and open bog areas. The open portion was treeless, dominated by sedges, dwarf birch and pitcher plants over sphagnum mosses. Sphagnum moss dominated all ground cover while shrubs were scarce and trees were scattered and short (Appendix I).

Six Plots Surveyed Along an 8 km Stretch of Mantagao Lake Road, August 22, 1979 (Fig. 2)

These plots represented a variety of Mantagao WMA habitats. They were done at least 100 meters off the road to limit road disturbance. Habitats included: a young trembling aspen stand (Appendix I), a mixed trembling aspen-jack pine stand (Appendix I), and a mature aspen stand (Appendix I).

The young aspen stand was pure, small and dense with a low shrub layer of rose, Saskatoon and buffaloberry over-topping a cover of vetches and grasses. The mature aspen was of medium-sized trees with scattered shrubs. Ground cover was limited, with hazel and early meadow rue only partially covering the ground surface.

White spruce was not found in a monoculture in the WMA. The trembling aspen-white spruce stand (Appendix I) was typical of boundaries between pure stands of black spruce and aspen or jack pine. Shrubs were limited, with buffaloberry the most common. Bare ground was exposed while hazel and early meadow rue provided scarce ground cover. The mixed stand (Appendix I) consisted of five tree species and typified an intergrade between more pure stands.

In the aspen-jack pine stand, shrubs were scattered and low with a thin carpet of bearberry, twinflower, moss and litter.

The black spruce plot typified Mantagao spruce stands where few shrubs and limited ground cover existed under dense tree stands.

Ten Survey Plots Done in a Mantagao Lake Mature Trembling Aspen Stand, July 19, 1979

The plots were located in the southeastern portion of the WMA east of the white spruce plantation (Fig. 2). The stand was of similar sized aspen with a fairly dense shrub layer of hazel, Saskatoon, chokecherry and downy arrow-wood. Grasses, vetches, sarsaparilla and strawberry were dominant in the extensive ground cover diversity (Appendix I).

A list of plant species sampled in Mantagao Lake WMA follows with flowering dates included for conspicuous species or those with obvious flowering bodies. Order of presentation follows Scoggan (1957).

PLANT SPECIES LIST - MANTAGAO WILDLIFE MANAGEMENT AREA

Family	Scientific Name	Common Name	Flowering Dates
Bryophyte	*Marchantia polymorpha*	Liverwort	
Equisetaceae	*Equisetum arvense*	Horsetail	
	Equisetum laevigatum	Smooth Scouring rush	
	Equisetum hyemale	Scouring-rush	
Polypodiaceae	*Pteridium aquilinium* var. *latiusculum*	Pasture brake	
Pinaceae	*Pinus banksiana*	Jack pine	
	Larix laricina	Larch	
	Picea mariana	Black spruce	
	Picea glauca	White spruce	
	Abies balsamea	Balsam fir	
	Juniperus communis	Common juniper	
Typhaceae	*Typha latifolia*	Cattail	
Sparganiaceae	*Sparganium eurycarpum*	Bur-reed	
Zosteraceae	*Potamogeton pectinatus*	Pond weed	
	Potamogeton richardsonii	Clasping-leaf pondweed	
Juncaginaceae	*Triglochin maritima*	Arrow grass	
Alismataceae	*Alisma triviale*	Water plantain	July 16-August 5
	Sagittaria cuneata	Arrowhead	July 16-August 5
	Sagittaria sp.	Arrowhead	August 13-19
Hydrocharitaceae	*Vallisneria americana*	Tape grass	
Gramineae	*Bromus inermis*	Brome grass	
	Phragmites communis var. *berlandieri*	Reed grass	
	Hordeum jubatum	Squirrel-tail	
	Elymus innovatus	Rye grass	

Family	Scientific Name	Common Name	Flowering Dates
Gramineae	Elymus canadensis	Giant wild rye	
	Koeleria cristata	Crested grass	
	Oryzopsis asperifolia	Harsh-leaved rice	
	Stipa comata	Feathergrass	
	Muhlenbergia glomerata var. cinnoides	Muhly grass	
	Phleum pratense	Timothy	
	Agrostis stolonifera var. major	Bentgrass	
	Spartina pectinata	Fresh-water cord-grass	
	Echinochloa crusgalli	Barnyard-grass	
Cyperaceae	Eleocharis acicularis	Spike rush	
	Scirpus validus	Bulrush	
	Scirpus acutus	Hard stem bulrush	
	Eriophorum angustifolium	Cottongrass	
	Eriophorum chamissonis	Bog cottongrass	
	Eriophorum chamissonis var. aquatile	Coarse bog cottongrass	
	Carex richardsonii	Sedge	
	Carex capillaris	Hairlike sedge	
	Carex atherodes	Wheat grass sedge	
	Carex retrorsa	Turned backward sedge	
	Carex rostrata	Beaked sedge	
	Carex lasiocarpa var. americana	Hairy-fruited sedge	
Lemnaceae	Lemna minor	Duckweed	
Juncaceae	Juncus dudleyi	Rush	
	Juncus nodosus	Bog rush	
Liliaceae	Asparagus officinalis	Asparagus	
	Allium stellatum	Onion	August 6-23
	Tofieldia glutinosa	False asphodel	
	Trillium cernuum	Nodding trillium	June 11-17
	Lilium philadelphicum	Western red lily	July 2-August 6
	Zigadenus elegans	Smooth camas	July 16
	Maianthemum canadense	Wild lily of the valley	J ne 25-July 22
	Smilacina stellata	False solomon's seal	June 11-July 8
	Smilacina trifolia	3-leaved false solomon's seal	June 25-July 1
	Disporum trachycarpum	Fairybells	May 28-June 3

Family	Scientific Name	Common Name	Flowering Dates
Iridaceae	Sisyrinchium montanum	Blue-eyed grass	June 11-July 15
	Iris versicolor	Larger blue flag	June 25-July 15
Orchididaceae	Cypripedium arietinum	Ram's head lady slipper	June 18-July 1
	Cypripedium calceolus var. parviflorum	Small lady yellow slippers	
	Cypripedium reginae	Showy lady slipper	
	Orchis rotundifolia	Round leaved orchis	June 25-July 1
	Habenaria obtusata	One leaf rein orchis	August 6-August 19
	Habenaria viridis var. bracteata	Frog orchis	June 11-July 15
	Habenaria dilatata	Leafy white orchis	August 6-19
	Corallorhiza striata	Spotted coralroot	June 11-July 8
	Spiranthes gracilis	Slender ladies'-tresses	July 16-August 12
	Spiranthes romanzoffiana	Hooded ladies'-tresses	July 23-August 29
	Goodyera repens	Dwarf rattlesnake plantain	July 23-July 29
Salicaceae	Populus tremuloides	Trembling aspen	
	Populus balsamifera	Balsam poplar	
	Salix sp.	Willow	
Betulaceae	Corylus americana	American hazel	
	Betula papyrifera	Paper birch	
	Corylus rostrata	Beaked hazel	
Urticaceae	Urtica dioica var. procera	Stinging nettle	
Fagaceae	Quercus macrocarpa	Bur oak	
	Ulmus americana	American elm	
Santalaceae	Comandra pallida	Pale commandra	June 11-July 1
Polygonaceae	Rumex occidentalis	Curled dock	
	Rumex maritimus var. fueginus	Golden dock	
	Polygonum scandens	Climbing false buckwheat	
	Polygonum amphibium var. stipulaceum	Water smartweed	
	Polygonum coccineum	Scarlet smartweed	

Family	Scientific Name	Common Name	Flowering Dates
Polygonaceae	Polygonum lapathifolium	Dock-leaved smartweed	
	Polygonum lapathifolium var. salicifolium	Dock-leaved smartweed	
Chenopodiaceae	Chenopodium capitatum	Strawberry blite	July 16-26
	Chenopodium album	Pigweed	July 16-August 5
Caryophyllaceae	Arenaria lateriflora	Grove sandwart	
	Arenaria dawsonensis	Rock sandwart	
	Stellaria longipes	Long-stalked starwort	June 11-24
	Cerastium arvense	Field chickweed	June 11-24
Nymphaeaceae	Nuphar variegatum	Water lily	June 25-August 5
Ranunculaceae	Clematis dioscorefolia	Climbing clematis	
	Actaea rubra	Red baneberry	
	Caltha palustris	Marsh marigold	May 25-July 1
	Anemone patens	Prairie crocus	May 21-June 10, then again August 6-12
	Anemone canadensis	Canada anemone	June 18-August 19
	Anemone quinquefolia var. interior	Wood anemone	May 28-June 24
	Anemone multifida forma sanguinea	Cleft anemone	
	Thalictrum dasycarpum	Purple meadow rue	
	Thalictrum confine	High meadow rue	
	Ranunculus circinatus var. subrigidus	White water crowfoot	
	Ranunculus flabellaris	Yellow water crowfoot	
	Ranunculus rhomboideus	Prairie buttercup	
Papaveraceae	Corydalis aurea	Golden corydalis	June 4-10
Cruciferae	Thlaspi arvense	Penny cress	July 2-22
	Brassica kaber	Wild turnip	
	Descurainia sophia	Tansy-mustard	
	Erysimun inconspicum	Treacle mustard	
	Arabis hulbelia var. collinsii	Rock cress	

Family	Scientific Name	Common Name	Flowering Dates
Sarraceniaceae	*Sarracenia purpurea*	Pitcher plant	June 11–August 23
Droseraceae	*Drosera rotundifolia*	Sundew	
Saxifragaceae	*Heuchera richardsonii*	Alumroot	
	Mitella nuda	Naked miterwort	June 25–July 15
	Ribes triste	Red currant	
	Ribes oxyacanthoides	Gooseberry	June 11–July 1
	Ribes americanum	Black currant	June 11–June 24
	Parnassia multiseta	Grass of parnassus	July 16–August 23
Rosaceae	*Spiraea alba*	Narrow-leaved meadowsweet	July 23–August 5
	Agrimonia striata	Cocklebur	
	Rosa acicularis	Woods rose	
	Fragaria virginiana	Common strawberry	May 28–July 8
	Geum triflorum	3-flowered avens	May 21–June 24
	Potentilla arguta	White potentilla	July 16–22
	Potentilla fruticosa	Shrubby cinquefoil	June 25–August 23
	Potentilla anserina	Silverweed	June 18–July 8
	Potentilla millegrana	Thousand-seeded cinquefoil	
	Rubus acaulis	Stemless raspberry	June 25–July 1
	Rubus pubescens	Dewberry	
	Prunus nigra	Canada plum	
	Prunus pumila	Sand cherry	
	Prunus pensylvanica	Pincherry	May 28–July 8
	Prunus virginiana	Chokecherry	June 11–24
	Crataegus sp.	Hawthorn	June 4–17
	Rubus idaeus	Raspberry	June 25–July 8
Leguminosae	*Trifolium pratense*	Red clover	July 2–22
	Trifolium repens	White clover	July 23–August 23
	Melilotus officinalis	Yellow sweet clover	July 2–August 23
	Melilotus alba	White sweet clover	July 2–August 23
	Petalostemum purpureum	Purple prairie clover	July 16–22
	Oxytropis splendens	Showy locoweed	July 2–22
	Astragalus canadensis	Milk vetch	
	Hedysarum alpinum var. *americanum*	Hedysarum	August 6–23
	Vicia americana	American vetch	

Family	Scientific Name	Common Name	Flowering Dates
Leguminosae	Lathyrus venosus var. intonsus	Wild peavine	July 2-22
	Lathyrus orchroleucus	White peavine	
Polygalaceae	Polygala paucifolia	Fringed milkwort	June 4-July 1
	Polygala senaga	Seneca root	July 1-August 5
Anacardiaceae	Rhus radicans	Poison ivy	July 2-17
Balsaminaceae	Impatiens capensis	Spotted touch-me-not	August 13-19
Aceraceae	Acer negundo	Manitoba maple	
Rhamnaceae	Rhamnus alnifolia	Alder-leaved buckthorn	
Violaceae	Viola nephrophylla	Bog violet	June 11-July 1
	Viola rugulosa	Western Canadian violet	May 28-July 1
	Viola pensylvanica	Smooth yellow violet	June 11-July 1
	Viola adunca	Hooked violet	May 21-July 1
Elaeagnaceae	Shepherdia canadensis	Buffaloberry	
Onagraceae	Epilobium angustifolium	Fireweed	
	Epilobium glandulosum var. adenocaulon	Glandular fireweed	
	Oenothera biennis	Common evening primrose	July 16-August 23
Hippuridaceae	Hippuris vulgaris	Mare's tail	
Araliaceae	Aralia nudicaulis	Wild sarsaparilla	June 11-July 1
Umbelliferae	Sanicula marilandica	Black snakeroot	
	Zizia aptera	Heart leaved Alexanders	
	Cicuta bulbifera	Water hemlock	
	Cicuta maculata	Spotted cowbane	July 9-August 19
	Heracleum lanatum	Cow parsnip	July 2-August 12

Family	Scientific Name	Common Name	Flowering Dates
Cornaceae	Cornus canadensis	Bunchberry	June 18-August 5
	Cornus rugosa	Round-leaved dogwood	
	Cornus stolonifera	Red osier dogwood	June 18-August 12
Pyrolaceae	Monotropa uniflora	Indian pipe	July 23-August 23
	Moneses uniflora	One flowered wintergreen	July 23-August 5
	Pyrola elliptica	Shineleaf wintergreen	August 6-12
	Pyrola asarifolia	Pink wintergreen	July 2-August 5
	Pyrola asarifolia var. purpurea	Purple pyrola	
Ericaceae	Andromeda glaucophylla	Bog rosemary	
	Ledum groenlandicum	Labrador tea	June 11-July 1
	Arctostaphylos uva-ursi	Bearberry	May 28-June 10
Primulaceae	Androsace septentrionalis var. puberulenta	Androsace	
	Naumbergia thyrsiflora	Tuffed loosestrife	July 2-15
	Steironema ciliatum	Rooting loosestrife	
Oleaceae	Fraxinus pennsylvanica	Green ash	
Gentianaceae	Menyanthes trifoliata	Buckbean	June 4-July 1
	Halenia deflexa	Spurred gentian	
	Gentiana amarella	Felwort	
	Gentiana crinita	Fringed gentian	July 2-August 23
Apocynaceae	Apocynum androsaemifolium	Spreading dogbane	July 2-August 12
Asclepiadaceae	Asclepias incarnata	Swamp milkweed	July 16-August 5
	Asclepias ovalifolia	Slender milkweed	
Convolvulaceae	Convolvulus sepium	Hedge bindweed	July 23-August 20
Boraginaceae	Lithospermum canescens	Hoary puccoon	June 11-August 15
	Cynoglossum officinale	Hound's tongue	
Labiatae	Scutellaria galericulata var. epilobiifolia	Marsh skullcap	July 2-August 23

Family	Scientific Name	Common Name	Flowering Dates
Labiatae	Agastache foeniculum	Giant hyssop	
	Moldavica parviflora	Dragonhead	
	Monarda fistulosa	Bergamot	July 16-August 19
	Prunella vulgaris var. lanceolata	Carpenter weed	
	Stachys tenuifolia var. hispida	Rough hedge nettle	July 23-August 5
	Lycopus asper	Bugleweed	July 23-August 5
	Mentha arvensis	Wild mint	July 23-August 5
Solanaceae	Chamaesaracha grandiflora	Large white ground cherry	August 13-August 19
Scrophulariaceae	Castilleja coccinea	Indian paintbrush	
	Castilleja miniata	Painted cup	
	Melampyrum leneare	Cow wheat	
	Pedicularis lanceolata	Loosewort	
	Pedicularis canadensis	Swamp loosewort	August 12-16
Lentibulariaceae	Utricularia minor	Slender bladderwort	June 11-17
	Utricularia intermedia	Flat leaved bladderwort	June 25-August 19
	Utricularia vugaris	Greater bladderwort	August 2-8
Plantaginaceae	Plantago major	Broad leaved plantain	July 16-22
Rubiaceae	Galium septentrionale	Northern bedstraw	
	Galium triflorum	Three-flowered bedstraw	
Caprifoliaceae	Linnea borealis	Twinflower	June 25-July 15
	Symphoricarpos occidentalis	Wolfberry	
	Symphoricarpos sp.	Snowberry	
	Lonicera dioica var. glaucescens	Twining honeysuckle	
	Lonicera villosa var. solonis	Mountain honeysuckle	
	Viburnum trilobum	Highbush cranberry	June 11-July 15
	Viburnum rafinesquianum	Downy arrow-wood	
	Viburnum lentago	Nannyberry	
Valerianaceae	Valeriana septentrionalis	Northern valerian	

Family	Scientific Name	Common Name	Flowering Dates
Campanulaceae	Campanula rotundifolia	Harebell	July 2-August 23
	Campanula aparinoides	Bellflower	
	Lobelia kalmii	Brook lobelia	July 30-August 23
Compositae	Eupatorium purpureum	Spotted joe-pye weed	July 16-August 5
	Liatris ligulistylis	Meadow blazing star	July 23-August 23
	Grindelia squarrosa	Gumweed	August 13-19
	Solidago hispida	Goldenrod	
	Solidago rigida	Coarse-stem goldenrod	
	Solidago graminifolia var. major	Grass-leaved goldenrod	
	Aster umbellatus var. pubens	Aster	
	Aster ptarmicoides	Sand aster	
	Aster laevis	Smooth aster	
	Aster furcatus	Burgess	
	Aster lateriflorus	One-sided aster	
	Erigeron strigosus	Fleabane	
	Erigeron glabellus	Smooth fleabane	July 23-August 23
	Antennaria campestris	Pussytoes	May 28-June 24
	Rudbeckia serotina	Blackeyed susan	July 16-August 23
	Helianthus laetiflorus var. rigidus	Rombic-leaved sunflower	July 23-August 5
	Helianthus maximiliani	Sunflower	July 23-August 23
	Gaillardia aristata	Gaillardia	July 2-August 23
	Achillea sibirica	Siberian yarrow	
	Achillea lanulosa	Woolly yarrow	
	Matricaria matricarioides	Pine appleweed	July 23-August 23
	Artemisia ludoviciana var. gnaphalodes	White sage	
	Artemisia absinthium	Absinthe	July 23-August 23
	Petasites sagittatus	Arrowleaved coltsfoot	May 21-June 17
	Senecio aureus	Golden ragwort	June 25-August 15
	Cirsium arvense	Canada thistle	July 16-August 23
	Cirsium drummondii	Thistle	
	Taraxacum offinale	Dandelion	May 28-August 23
	Lactuca pulchella	Blue lettuce	July 16-August 23
	Agoseris glauca	False dandelion	June 25-July 29
	Crepis tectorum	Hawk's-beard	
	Prenanthes alba	White lettuce	

Mammals

Small mammals were trapped in eight Mantagao habitats (Fig. 2); the results are compiled in Table 1. Red-backed voles were most abundant in forested areas while meadow voles were common in open areas. Meadow jumping mice and deer mice were caught in five of the eight habitats while shrews were seldom caught.

An annotated list of Mantagao WMA mammals from the summer of 1979 follows. Species identified by sign only are indicated in species discussion.

Annotated Mammal List for Mantagao Lake Wildlife Management Area

Masked Shrew (Sorex cinereus)

Seven specimens of masked shrews were trapped. All were in black spruce bog habitats (Table 1). All specimens were captured in treed areas of bogs; traps set in treeless areas did not capture shrews. Sphagnum mosses dominated the ground cover in bogs, providing the humid habitat required by these creatures. Ground cover in other trap sites was often sparse which is less suitable for masked shrews.

American Water Shrew (Sorex palustris)

One American water shrew was caught along the Mantagao River at a site where a grassy meadow slopes gradually down to the river's edge. The river bank was covered by a thick growth of sedges and small pools of water extended into the sedges. The shrew was caught at the edge of one small pool in heavy sedges. Another trapline along the river where the bank is much more steep and shrub covered produced no water shrews.

Hoary Bat (Lasiurus cinereus)

In late July several sightings of bats were made during late evening drives or walks. With the aid of a flashlight, specimens of

Table 1. Mantagao W.M.A. Small Mammal Trapping Results from 1979.

Trapline	Jack Pine	Aspen Bird Plot	River Bank	Spruce Bog 1.		Lake Ridge		Spruce Bog 2.	River Edge	Open Field	
Dates	Jul 4–6	Jul 9–11	Jul 9–11	Aug 8–10		Aug 14–15		Aug 15–16	Aug 21–22	Aug 21–22	Total
Trap Nights	200	200	200	200		200		200	200	200	1600
				Open	Treed	N.	S.				
Masked Shrew	–	–	–	–	4	–	–	2	–	–	6
Water Shrew	–	–	–	–	–	–	–	–	4	–	4
Deer Mouse	4	1	5	–	–	8	4	–	–	–	22
Meadow Jumping Mouse	–	2	3	–	–	6	3	–	36	–	50
Meadow Vole	–	–	5	3	2	2	8	4	36	4	64
Red-backed Vole	5	8	3	2	15	6	1	8	4	–	52
Totals	9	11	16	5	21	22	16	14	80	4	198

hoary bats were identified according to size, flight pattern and color. Most sightings were made over roads and borrow pit pools in areas where aspen forest dominated. Most bats observed were believed to be hoary bats, but positive identification was made only once. Bat sightings were confined to the southern part of the WMA and surrounding areas.

Snowshoe Hare (Lepus americanus)

Snowshoe hares were abundant in the area. Sightings and sign were found in all major habitat types except open bogs and marshes. Early on the study before the shrubs leafed fully, hare browse sign was encountered frequently, often in conjunction with ungulate browse sign. Some individual shrubs showed signs of hare browse on lower branches and ungulate browse on upper ones. One potential indicator of hare numbers encountered was the apparent success of breeding Great Horned Owls in the area. Several broods of fledged young were encountered. On two occasions owls were observed carrying hare carcasses. Remains of partially eaten hares were common finds.

Eastern Chipmunk (Tamias striatus)

One adult chipmunk was observed on June 2 in the aspen songbird census plot. The plot is fairly open aspen with a good shrub layer. The chipmunk was observed foraging beneath some beaked hazel shrubs (in the leaf litter). This was the only chipmunk sighting made. None were trapped. *Notable by its absence was the least chipmunk (Eutamius minimus).

Woodchuck (Marmota monax)

Woodchucks were common in the area. More than a dozen sightings were recorded and later in the study many sightings were left unrecorded. They were most often seen along the road in aspen stands. Burrows were often found and were commonly dug under piles of wood and bush heaped up

by road and trail clearing activities. The ridge surrounding Mantagao Lake also contained several burrow sites. On July 18 a young woodchuck was found near one such burrow on the lake ridge. On August 16 a dead adult female was found along Highway 325, 6 kilometers east of the area. This specimen was prepared as a study skin and donated to the Manitoba Museum of Man and Nature.

Thirteen-lined Ground Squirrel (Spermophilus tridecemlineatus)

Common in the area. Drier habitats and openings are the main haunts of thirteen-lined ground squirrels. Specimens were seen frequently in aspen stands. The various dry meadows and forage fields located in the area also provided numerous sightings. Burrow entrances were commonly found on the open ground of these fields. The northwestern part of the area, comprised largely of bogs and fens, contained few ground squirrels. Ground squirrels were common along Idlewilde Road which is built on a long gravel ridge running up the west boundary of the area. A lactating female was trapped and a skin prepared and donated to the Museum.

Franklin's Ground Squirrel (Spermophilus franklinii)

Uncommon in the area. Four sightings were made in the study period. One was in a farmer's yard outside the area and the other three were in aspen stands, including the bird census plot.

Red Squirrel (Tamiasciurus hudsonicus)

Common in the area. All stands of coniferous trees investigated had sign of red squirrels. Middens were common in mature jack pine stands as well as in small black and white spruce stands. Individuals were more often heard than seen. Some sightings occurred in aspen stands although far more often in conifers.

Beaver (Castor canadensis)

Beaver sign was common in the area, but only one beaver sighting was made. A total of 21 active lodges or sites of fresh activity were located within the area. Mantagao Lake itself had at least six active lodges around its edges. The first six kilometers of the Mantagao River had seven active lodges along its banks. Few lodges were checked more than once and since only one sighting of a beaver was made no estimates of breeding success or relative numbers of animals present per lodge was made. Aspen was the chief food source in all activity sites. Along the river, lake and other water bodies in the area, aspens are severely depleted around old and abandoned beaver lodges. Beavers have a significant influence on the frequency of tree species along such waterways. Beaver activities also play an important role in drainage of this area. Many of the large fens and bogs are drained by small creeks which have become dam sites and subsequently beaver ponds.

The figure of 21 active sites doubtlessly represents only a fraction of the total numbers. Several small lakes, creeks and much of the bog and fen areas were not investigated.

Deer Mouse (Peromyscus maniculatus)

Common in certain habitats. A total of 22 specimens were snap-trapped. They were caught in jack pine and aspen stands and along lake ridge and river bank. All capture sites were well treed with a fairly open ground layer, usually with dense shrubs present. The surface ranged from dry (jack pine) to damp (River bank), none were caught in wet sites.

Red-backed Vole (Clethrionomys gapperi)

Common over the entire area. Only one trapline failed to produce red-backed voles (open field). A total of 55 were trapped. They were found

in aspens, jack pines, spruce bogs, along the river bank and on the lake ridges. Four were caught away from treed sites. Of the 44 small mammals caught in spruce bogs, 30 were red-backed voles.

Muskrat (Ondatra zibethicus)

Fairly common in area water bodies. Only four houses were recorded but sightings were common along the shore of Mantagao Lake. Many of the sedge marshes and fens were too thickly vegetated to allow for observation of houses while ponds were often thickly vegetated on the shores, making observations difficult. Marshy areas along the Mantagao River and other streams often showed signs of muskrat habitation. Bulrush stands along the edge of the lake were being used as a food source by mid-August. Observations of muskrats on the lake increased at about this time. One gravel pit at the southeast entrance to the area had several skeletons of muskrats (and other fur bearers), presumably from carcasses deposited by trappers.

Meadow Vole (Microtus pennsylvanicus)

Common in habitats with a thick damp ground cover. Thirty-three were caught in areas varying from spruce bogs to grassy river banks. Sites with damp grassy areas or heavy sedges produced the most meadow voles. Traplines placed in a forest with open ground layers caught none.

Meadow Jumping Mouse (Zapus hudsonius)

Common in aspens and along waterways. Twenty-three specimens were taken from along the Mantagao River and lake ridge and from the bird plot aspen stand. Sightings of live jumping mice were made on several locations in other aspen stands. Catches of this species were much higher along the waterways than in aspens removed from open water.

Coyote (Canis latrans)

Coyotes were never seen in the area, but skulls of trapper-killed

coyotes were found in local gravel pit. Tracks were occassionally found by the river and on dirt roads and trails. Several scats were found on roads in various parts of the area. Differentiating between the three canid species assumed to dwell within the area, on the basis of sign, was not always possible. Some overlaps in track, gait and scat size due to size and age class variations often made determination difficult. A few instances of near positive indentification were made. Estimating wild canid numbers and species diversity was difficult, particularly when dogs may have also been responsible for sign. Coyotes were in the area, but their numbers, activities or habitat preferences were undetermined.

Red Fox (Vulpes vulpes)

Sign analysis being less than definitive, it was difficult to speculate on the status of area foxes. None were sighted and no remains were found. Scats which were likely those of fox were found as well as occasional sets of tracks.

Wolf (Canis lupus)

No wolves were sighted during the study but tracks and scats were found in the northern part of the WMA. Several sets of tracks and a scat were observed north of the river along dirt roads. Another scat was found 13 kilometers north of the area on Idlewilde Road. No sign was recorded south of the lake and river.

Black Bear (Ursus americanus)

Fairly common in the area. They were sighted on several occasions though only one cub was observed (in the Wildlife Management Area's north-east corner). A sow and two yearlings were seen on two occasions south of the river. Bears and their sign were found in all parts of the area and in most habitat types. In May and early June the remains of deer (winter

kills) were being scavenged by bears. In one instance, six deer carcasses were progressively consumed and/or removed from a gravel pit near the south-east entrance to the area.

Ermine (Mustela erminea)

This species was seen on two occasions, both just outside the area. One was beneath the check station 1.5 kilometers south of the area. The other weasel was along the dirt road leading to the fire tower in the south-east corner of the area.

Mink (Mustela vison)

No mink were observed, although tracks were recorded along the Mantagao River. Due to the rocky nature of the substrate few sites exist along the river and lake shores which were suitable for finding tracks. Suitable spots were re-checked and fresh tracks were noted. Only scanty observations of any species were made at these sites.

Skunk (Mephitis mephitis)

Skunks are apparently uncommon in this area. None were seen although their presence was established through olfactory detection on several occasions. Roads and highways near the area were virtually free of dead skunks. One carcass, apparently a trapper kill, was found in the area. As expected, the area's garbage dump was frequently the centre of skunk aroma, but none were observed.

White-tailed Deer (Odocoileus virginianus)

Deer were common in the area. Forty-one sightings were recorded (34 adult females, 2 fawns and 5 bucks) during the study. Most sightings were made along roadsides in aspen stands or along the edges of waterways. Sightings and sign were witnessed in all major habitat types. Nearly a dozen carcasses (winter mortality) in varying states of decay were located

throughout the area. Tracks were common along roadsides and on the many small roads and bush trails.

Early in the study some counts of winter pellet groups were conducted. These were done by walking a line of a certain length through a given habitat, counting all pellet groups within one meter on either side of that line. A count was conducted in the bird census plot (see Map 2 for location), a stand of medium-sized aspens with a fairly heavy shrub layer. The results of covering 3200 m^2 were: Deer - 80 pellet groups, Moose - 11, Elk - 6. A second count in an adjoining stand of aspens (the white spruce plantation) produced in a 1600 m^2 area, 26 deer and one moose pellet group. The plantation stand abutts the bird plot, but has been altered by parallel slashes cut through it and planted to white spruce. These spruce now average around 1 - 1.3 m high. The slashes open the area greatly and shrub growth is reduced as compared to the bird plot stand. The pellet counts seem to indicate that ungulate winter use of the undisturbed stand was higher than the more open disturbed site.

A second set of counts were conducted in the alfalfa field by the southeast entrance to the area. A 1600 m^2 area in the centre open part of this field contained 49 deer pellet groups while a 3200 m^2 area along the edge of the field contained only 46 deer pellet groups. The field itself was approximately 800 x 200 m running north-south with sparse alfalfa and grasses, surrounded by a stand of aspens and mixed spruce-aspen woods. The ground in this field was virtually covered with deer tracks. Some fresh tracks and summer droppings were found here as well. The apparent greater use of the centre of the field and exclusive use of this area by deer is of interest. Only one set of moose tracks was found in this field. These followed the field edge for a short distance.

Moose (Alces alces)

Moose were common, often sighted along waterways. Thirteen moose were observed, 9 cows and 2 cows with single calves. Sightings were distributed throughout the area. Tracks were common along trails near bodies of water, but evidence was apparent in aspen stands far from water. Marshes and borrow pit pools were favorite haunts for moose, particularly during the fly season. (See the deer section for moose pellet count results).

Elk (Cervus elaphus)

Elk and elk sign were encountered infrequently. Four live elk were sighted, a cow and calf in an alfalfa field west of Cruiser Lake, one cow along the west shore of the lake and one cow in a farm field just west of the area. Three dead elk (2 females and one male) were found along a short stretch of shore just west of the southern campsite on Mantagao Lake. All had died since the spring, but cause of death was undeterminable. Elk winter pellets were found in abundance in the field at the south end of Pearl Lake and at the campsite along the west side of Mantagao Lake. Other fields in the north area were not investigated early enough to determine presence of winter sign. Tracks were found along roads near Mantagao Lake on a few occasions. Pellet counts in the bird plot (see deer section) showed that elk did spend time in this area. A shed antler was also found in the bird plot.

Birds

Sightings of birds from all Mantagao areas visited were recorded during the 1979 field season. In addition a 16 hectare songbird census plot was established in a mature trembling aspen forest (Fig. 2). Least Flycatchers and Red-eyed Vireos were the most abundant species. Thirty-seven territorial males of 14 species resided within the plot (Appendix II). Road survey counts were made on six occasions within the wildlife management area. These totalled 71 kilometers and recorded 69 bird species (Appendix III). Waterfowl brood counts were made in several small lakes within the area and in borrow pits along the road system. A variety of waterfowl species were recorded although numbers of a given species were limited (Appendix IV).

Data collected on general observations of Mantagao's avifaunal populations were compiled in an annotated list. The explanation of terms follows. Dates beside scientific names indicate the first record for the species in the WMA.

Abundant - Recorded on almost all visits to their preferred habitat during the breeding season. Actual numbers are variable according to species' breeding habitats.

Common - Recorded on a majority of visits to their preferred habitat during the breeding season. Actual numbers are variable according to species' breeding habitats.

Uncommon - Present in their preferred habitat during the breeding season but occurs in low numbers and often is difficult to find.

Rare - Present, not necessarily during the breeding season, but recorded in very low numbers at varying locations.

* - A species with Mantagao Lake Wildlife Management Area breeding confirmed.

ANNOTATED BIRD LIST FOR MANTAGAO LAKE WILDLIFE MANAGEMENT AREA

This list follows the nomenclature of the fifth edition of the Check-list of North American birds (A.O.U. 1957) and the 33rd supplement (A.O.U. 1973).

COMMON LOON* Gavia immer May 24 (Common)

Seen on all management area lakes visited during the study. An adult bird and two young were observed on Mantagao Lake, July 19.

HORNED GREBE* Podiceps auritus June 15 (Uncommon)

Occasionally seen in several beaver ponds and borrow pits in the area. A pair accompanied by two young were observed on Cruiser Lake, July 31.

WESTERN GREBE Aechmophorus occidentalis June 3 (Rare)

Sighted once during the study, when a pair was noted on Mantagao Lake.

PIED-BILLED GREBE* Podilymbus podiceps May 23 (Uncommon)

Infrequently seen in the management area. An immature was spotted in a borrow pit along Idlewild road, August 15.

GREAT BLUE HERON Ardea herodias May 24 (Uncommon)

Occasionally sighted along Mantagao Lake and on several beaver ponds in the area.

AMERICAN BITTERN Botaurus lentiginosus May 23 (Uncommon)

Seen several times along the west lake road and in a cattail marsh located off east lake road.

WHITE PELICAN Pelecanus erythrorhynchos June 15 (Common)

Seen throughout the summer feeding on Cruiser and Mantagao lakes, the Mantagao River, and a large beaver pond off the west lake road. Groups of up to 20 individuals were common.

CANADA GOOSE* Branta canadensis May 15 (Common)

Canada Geese arrived in the management area well before the ice was off the lakes. The first sighting was of a pair seen in a field near Cruiser Lake. Two broods were noted on Pearl Lake, June 18. Canada Geese were observed on Mantagao Lake on May 24 (a group of 12), then not until August 13 (a group of 7). From August 13 to August 28 small groups were regularly encountered on the lake.

SNOW GOOSE Chen caerulescens May 15 (Common Migrant)

Flocks of Snow Geese were seen flying over the management area in early May. An unusual sighting of a lone moulting individual was made by D. Collicutt and W. Koonz as they canoed Mantagao Lake on July 31.

MALLARD* Anas platyrhynchos May 15 (Common)

Commonly seen throughout the management area. The first brood was observed on June 15. Broods of downy young continued to be seen until late August. This was the most common dabbling duck in the area.

GADWALL* Anas strepera May 24 (Uncommon)

Occasionally encountered in the management area. Sighted on the Mantagao River, Mantagao Lake and a beaver pond along west lake road. A brood of five downy young was seen on August 15 on a west lake road beaver pond.

PINTAIL Anas acuta May 24 (Rare)

A lone male Pintail spotted in a ditch along Idlewild road was the only record for the study.

GREEN-WINGED TEAL Anas crecca May 23 (Uncommon)

Not seen in large numbers, although individuals were sighted regularly throughout late spring and summer.

WOOD DUCK Aix sponsa June 28 (Rare)

Noted on two occasions; the first, June 28, a pair along the Mantagao River, and July 25, two males along the northern edge of Mantagao Lake.

REDHEAD Aythya americana June 4 (Rare)

A lone female observed in a borrow pit along Highway 325, represents the only sighting of Redheads in the area.

RING-NECKED DUCK* Aythya collaris May 23 (Common)

Most commonly seen in borrow pits along Highway 325, although individuals were encountered on lakes, rivers, small marshes and beaver ponds. A brood was observed in a borrow pit along Highway 325 in late July.

BLUE-WINGED TEAL* Anas discors May 24 (Common)

Regularly seen throughout the spring and summer. A female and one young were sighted on July 17. Groups of immature Blue-winged Teal were occasionally seen in late summer.

AMERICAN WIGEON* Anas americana May 23 (Common)

Most commonly seen on the Mantagao River. Also recorded throughout the area on lakes and borrow pits. A female with six young were seen June 28 along the Mantagao River.

NORTHERN SHOVELER Anas clypeata May 24 (Rare)

One sighting during the course of the study: May 24, a pair in a flooded sedge meadow along the west lake road.

CANVASBACK Aythya valisineria May 23 (Uncommon)

Regularly seen on the area's lakes, but never in large numbers.

LESSER SCAUP Aythya affinis June 18 (Uncommon)

Not common in the management area, being observed on limited occasions. One pair and six lone males were seen on Pearl Lake, June 18. They were not again encountered until August 15 when two lone males were recorded on a beaver pond.

COMMON GOLDENEYE* Bucephala clangula May 15 (Common)

One of the more common species of ducks in the area. Four separate broods were recorded on Mantagao Lake, June 28.

BUFFLEHEAD* Bucephala albeola June 18 (Uncommon)

Seen infrequently along the Mantagao River and on Pearl and Cruiser lakes. A female with a brood of eight was encountered while canoeing the Mantagao River on June 28.

WHITE-WINGED SCOTER* Melanitta deglandi June 3 (Common)

Observed on larger lakes including Mantagao, Cruiser and Pearl. A pair was seen on Mantagao Lake, June 3, and six pairs were seen on Pearl Lake,

July 18. A female with eight downy young, July 31, Cruiser Lake.

RUDDY DUCK Oxyura jamaicensis June 1 (Uncommon)

Not common. Two sightings, a single male in a cattail marsh on June 1, and two lone males on Pearl Lake, June 18.

COMMON MERGANSER Mergus merganser July 31 (Rare)

Recorded in the area only on July 31 when a lone male was seen on the Mantagao River. Hooded and Red-breasted mergansers were notably absent in the Wildlife Management Area.

GOSHAWK Accipiter gentilis August 15 (Rare)

On August 15 one of these large accipiters was observed as it flew into a spruce stand along Idlewild road near the northern boundary of the management area.

SHARP-SHINNED HAWK Accipiter striatus May 31 (Uncommon)

First sighted over the trembling aspen songbird plot (Map II). Sharp-shinned Hawks were sighted in the management area on less than 10 occasions.

COOPER'S HAWK Accipiter cooperii July 18 (Rare)

One sighting of this species was made along Idlewild road, as it flew into a mixed jack pine, spruce stand.

RED-TAILED HAWK* Buteo jamaicensis May 15 (Common)

Common. A nest with three young was found at the edge of a trembling aspen stand off the southeast fire tower road, June 16. A fourth young was found dead at the base of the tree.

BROAD-WINGED HAWK Buteo platypterus May 15 (Abundant)

This species was abundant along roadsides bordered by aspen stands. In August, sightings dropped to four.

BALD EAGLE Haliaeetus leucocephalus June 28 (Rare)

Observed on three occasions, all single adults. One near the mouth of the Mantagao River, two along the northern edge of Mantagao Lake.

MARSH HAWK Circus cyaneus May 24 (Common)

Regularly seen throughout the study, flying over marshes, open meadows and ditches in the management area.

OSPREY Pandion haliaetus June 28 (Rare)

An Osprey seen perched on a dead aspen along the Mantagao River on June 28 was the only record.

AMERICAN KESTREL* Falco sparverius May 15 (Common)

Kestrels were common throughout the spring and summer months, especially along the dry jack pine ridges.

RUFFED GROUSE* Bonasa umbellus May 15 (Common)

In late May and early June drumming was frequently heard in and near aspen stands. Individuals were regularly seen throughout the summer. A hen with a single young was observed along the river road on July 6.

SHARP-TAILED GROUSE* Pedioecetes phasianellus May 15 (Common)

Seen regularly throughout the summer. A hen with a brood of five was observed along the southeast lake road on July 31.

SANDHILL CRANE* Grus canadensis May 15 (Common)

Commonly seen throughout the study. On June 13 a pair of cranes in a sedge meadow west of the Check Station was approached. They did not fly up, but rather one of them showed distraction display or injury feigning. A search of the meadow where the cranes presided did not produce a nest or young. Dr. W. J. D. Stephen from the Canadian Wildlife Service found several nests in the management area during his April-June 1980 visit.

SORA* Porzana carolina May 24 (Common)

The first sighting of this species was of an individual that flushed from a sedge meadow along the west lake road. A subsequent nest search of a large sedge meadow on July 18 was successful. Soras were not only common in sedge meadows but also in cattail and bulrush stands.

YELLOW RAIL Coturnicops noveboracensis May 24 (Uncommon)

Recorded on the basis of its call rather than on sightings. Yellow Rails were found to be inhabiting at least two sedge meadows in the area. In one of these meadows at least six birds were heard at one time. Intensive searches for a nest were unsuccessful.

KILLDEER* Charadrius vociferus May 15 (Common)

Common along roadsides, in fields and other disturbed sites. A pair of adults and two young were seen on July 4 along the roadside near the Mantagao River.

UPLAND SANDPIPER Bartramia longicauda June 27 (Uncommon)

The first sighting was an individual in an open grassy meadow off the southeast fire tower road. Several pairs were noted in that area throughout the remainder of the summer.

FRANKLIN'S GULL Larus pipixcan May 15 (Uncommon)

The status of this species in the management area was similar to that of the Ring-billed Gull. Franklin's Gulls were commonly seen in the ploughed fields just outside the area's boundary, but were seldom recorded in the area itself.

COMMON TERN Sterna hirundo June 3 (Uncommon)

Three were observed on Mantagao Lake, June 3. This species was infrequently encountered on the area's lakes.

CASPIAN TERN Sterna caspia August 15 (Rare)

Observed in the management area August 15 when five were seen flying along the west shore of Mantagao Lake.

BLACK TERN* Chlidonias niger May 24 (Common)

Commonly recorded in the management area. A nest was located in some sedges at the edge of a beaver pond.

MOURNING DOVE* Zenaida macroura May 24 (Common)

Commonly seen during the study period. Mourning Doves were found to be using several habitat types for nesting, including jack pine, aspen and willow.

BLACK-BILLED CUCKOO Coccyzus erythropthalmus June 27 (Uncommon)

Occasionally encountered throughout the summer in hedgerows and patches of dense shrub. They were most evident in July and August.

GREAT HORNED OWL* Bubo virginianus June 17 (Common)

An immature was sighted on June 17 near the Mantagao River. Several days later a group of immatures was seen in the same vicinity. They were

easy to approach having recently fledged. Another group of immature owls was seen along the Idlewild road in the northwest part of the area in late June.

BARRED OWL *Strix varia* June 4 (Rare)

One was heard calling near the aspen songbird plot, early in the morning of the June 4 bird census. This was the only record for the species during the study.

LONG-EARED OWL *Asio otus* June 17 (Rare)

A single Long-eared Owl was seen on a hydro pole just north of the Check Station.

WHIP-POOR-WILL *Caprimulgus vociferus* May 23 (Very Common)

First heard calling, May 23. Their calling continued throughout June and July.

COMMON NIGHTHAWK* *Chordeiles minor* May 29 (Common)

Common during the study. On July 4 an adult flushed from a nest in a jack pine stand. The nest contained two flightless young.

RUBY-THROATED HUMMINGBIRD *Archilochus colubris* June 3 (Rare)

Two sightings were made during the study period. On June 3 an adult male was seen along Mantagao Lake in an area covered in bur oak and trembling aspen. On June 5 a female was spotted along the edge of an aspen stand near the Mantagao River.

BELTED KINGFISHER* *Megaceryle alcyon* June 12 (Uncommon)

One pair was regularly encountered along the Mantagao River and another along Mantagao Lake during the study period.

COMMON FLICKER Colaptes auratus May 15 (Common)

On May 24 an adult was seen flying across the river road into an aspen stand.

YELLOW-BELLIED SAPSUCKER* Sphyrapicus varius May 15 (Common)

First spotted in an aspen stand near the Mantagao River. Sapsuckers were regularly encountered throughout the spring and summer months.

PILEATED WOODPECKER Dryocopus pileatus May 24 (Rare)

On May 24 an adult was seen flying across the river road into an aspen stand.

HAIRY WOODPECKER* Picoides villosus June 3 (Common)

First observed on June 3, this species was found to be common. A nest was located on June 16 in an aspen stand off the southeast fire tower road.

DOWNY WOODPECKER* Picoides pubescens June 1 (Common)

Although not seen as often as the Hairy Woodpecker, the Downy Woodpecker was a common species in the area.

NORTHERN THREE-TOED WOODPECKER Picoides tridactylus June 4 (Rare)

A female seen on June 4 is the only record. The individual was on a decayed black spruce tree in a small spruce stand. It was very tame, allowing close approach by the observer.

EASTERN KINGBIRD* Tyrannus tyrannus May 23 (Common)

Common in the area throughout the study period. Three Eastern Kingbird nests were found along the Mantagao River on June 28.

GREAT CRESTED FLYCATCHER* Myiarchus crinitus May 28 (Common)

A common inhabitant of the aspen forests. A nest was discovered in a dead aspen tree in the aspen bird census plot on July 10.

EASTERN PHOEBE Sayornis phoebe June 3 (Uncommon)

Seen only occasionally throughout the study, the Eastern Phoebe was first noted during a road census. A pair was observed at the southeast fire tower.

ALDER FLYCATCHER Empidonax alnorum June 3 (Common)

Common in willow and alder growth throughout the area.

LEAST FLYCATCHER* Empidonax minimus May 23 (Abundant)

Very abundant in aspen forests.

EASTERN WOOD PEWEE Cantopus virens June 4 (Uncommon)

Encountered on several occasions. On June 4 one was observed in an aspen stand near a gravel pit off the river road. On June 14 a pair was seen at the southeast fire tower.

OLIVE-SIDED FLYCATCHER Nuttalornis borealis June 27 (Common)

Common inhabitants of the spruce and jack pine areas of the northern part of the management area.

TREE SWALLOW* Iridoprocne bicolor May 15 (Common)

Common along the river and lakes near dead trees. Nests were discovered along the Mantagao River and at a beaver pond off the west lake road.

BARN SWALLOW* Hirundo rustica May 23 (Common)

Seen throughout the area, especially near old cabins and buildings.

Nests were found on the Check Station buildings and in a deserted cabin on a small island on Mantagao Lake.

CLIFF SWALLOW Petrochelidon pyrrhonota June 15 (Rare)

Recorded once. On June 15 four birds were being chased by a pair of Barn Swallows near the Check Station. A nearby farm, just outside the area, was found to harbour a colony of Cliff Swallows.

GRAY JAY Perisoreus canadensis May 23 (Uncommon)

Occasionally seen in spruce and jack pine stands.

BLUE JAY Cyanocitta cristata May 15 (Common)

Common inhabitants of the management area.

BLACK-BILLED MAGPIE Pica pica June 12 (Uncommon)

Although more common in neighbouring farmland, magpies were sighted irregularly throughout the study area.

COMMON RAVEN Corvus corax May 15 (Common)

Recorded in small numbers throughout the spring and summer months. They were occasionally seen along roadsides feeding on roadkills.

COMMON CROW* Corvus brachyrhynchos May 23 (Common)

Frequently seen. A nest was found in an aspen tree in late May.

BLACK-CAPPED CHICKADEE Parus atricapillus May 15 (Common)

A common resident of the management area, especially along the Mantagao River.

BOREAL CHICKADEE Parus hudsonicus August 14 (Rare)

Boreal Chickadees were not recorded in the area until August 14, when two individuals were seen in a stand of black spruce along Idlewild road.

WHITE-BREASTED NUTHATCH Sitta carolinensis July 31 (Rare)

On July 31 an adult was spotted in an aspen along Mantagao Lake.

HOUSE WREN Troglodytes aedon May 30 (Common)

House Wrens were often noted in aspen and mixed woods stands.

SHORT-BILLED MARSH WREN* Cistothorus platensis May 28 (Common)

Recorded in many of the sedge meadows that occur within the management area. A nest was found in a sedge meadow west of the Check Station.

LONG-BILLED MARSH WREN Cistothorus palustris May 28 (Common)

Common in the cattail and bulrush marshes in the area.

GRAY CATBIRD Dumatella carolinensis May 28 (Uncommon)

Occasionally seen and heard in dense shrub and woods throughout the area. They were encountered most frequently along the Mantagao River.

BROWN THRASHER Toxostoma rufum May 23 (Uncommon)

Occasionally recorded in open shrub areas in the management area.

AMERICAN ROBIN Turdus migratorius May 23 (Common)

Seen throughout the management area along roadsides, and in aspen and mixed woods.

HERMIT THRUSH Catharus guttatus May 23 (Abundant)

Commonly heard singing from jack pine and spruce stands.

SWAINSON'S THRUSH Catharus ustulatus June 18 (Rare)

An individual was heard singing throughout June and early July from a spruce stand located off the southeast fire tower road.

VEERY* Catharus fuscescens May 29 (Common)

Most common in dense aspen forests in the management area. A nest was found in the aspen bird census plot in late June.

RUBY-CROWNED KINGLET Regulus calendula May 23 (Common)

Most common in the spruce forests of the area, but they were occasionally seen in jack pine and aspen stands.

CEDAR WAXWING Bombycilla cedrorum June 18 (Common)

Not noted until mid-June, when a small flock was seen flying over Pearl Lake. They became common in July and August.

COMMON STARLING* Sturnus vulgaris June 13 (Uncommon)

Seen regularly only in the southeast corner of the management area. Two nests were discovered in the area.

RED-EYED VIREO Vireo olivaceus May 29 (Abundant)

This species was abundant in the area's aspen forests.

PHILADELPHIA VIREO Vireo philadelphicus June 1 (Uncommon)

Sighted at two locations in the area: along the Mantagao River and in the aspen bird plot.

YELLOW WARBLER Dendroica petechia May 24 (Rare)

Sighted on two occasions: May 24, a male seen in willows along the west lake road, June 26, a male heard singing from an aspen stand along Idlewild road.

MAGNOLIA WARBLER Dendroica magnolia June 3 (Uncommon)

Occasionally recorded in the management area. The first observation was of a male in a small mixed spruce-aspen stand along Mantagao Lake. Sightings also occurred in other areas of similar habitat type.

CAPE MAY WARBLER Dendroica tigrina June 1 (Uncommon)

Individuals were recorded throughout the study in thick spruce stands, along the river road and near the Mantagao River.

YELLOW-RUMPED WARBLER Dendroica coronata May 23 (Common)

Common during spring migration and in late August in the vicinity of spruce and jack pine stands.

CHESTNUT-SIDED WARBLER Dendroica pensylvanica May 29 (Common)

Commonly seen in areas of aspen cover.

BAY-BREASTED WARBLER Dendroica castanea June 6 (Rare)

The only observation occurred on June 6, when a female was seen in a mixed spruce-tamarack stand near the southeast entrance to the management area.

BLACKPOLL WARBLER Dendroica striata June 18 (Rare)

The only record of this species for the study was of an individual in a stand of black spruce situated off Idlewild road.

PALM WARBLER Dendroica palmarum June 27 (Rare)

The only Palm Warbler sighting occurred in a thick stand of black spruce off Idlewild road on June 27.

OVENBIRD Seiurus aurocapillus May 25 (Abundant)

The most common warbler in the area. Sighted throughout the management area in aspen, jack pine and mixed-wood forests.

CONNECTICUT WARBLER Oporornis agilis May 25 (Abundant)

The second most common warbler. They were noted along the Mantagao Lake and Mantagao River, as well as in many aspen and mixed-wood forests.

WARBLING VIREO Vireo gilvus June 28 (Rare)

On June 28 an individual was spotted on a green ash tree along the Mantagao River.

BLACK-AND-WHITE WARBLER Minotilta varia May 23 (Common)

Although most evident in the wooded area along the Mantagao River, individuals were also noted in other aspen stands.

TENNESSEE WARBLER Vermivora peregrina May 25 (Common)

First noted in a large flock of mixed warblers along Mantagao Lake. They were common throughout the management area post May 25 until the end of the study in late August.

ORANGE-CROWNED WARBLER Vermivora celata June 3 (Rare)

A single Orange-crowned Warbler was seen in a mixed spruce, aspen stand on June 3.

NASHVILLE WARBLER Vermivora ruficapilla May 24 (Common)

Common throughout the management area. Recorded throughout the summer, this species was noted in aspen and mixed-wood forests.

MOURNING WARBLER Oporornis philadelphia June 1 (Common)

Common in aspen stands which had thick understories.

COMMON YELLOWTHROAT* Geothlypis trichas May 25 (Common)

Common along the Mantagao River, Mantagao Lake and in most willow growth. A female was seen feeding two flightless young in early July along Mantagao Lake.

WILSON'S WARBLER Wilsonia pusilla May 24 (Uncommon)

Occasionally noted. A male in willows along the west lake road was the first sighting of this species. An individual was seen during the lake road census June 4.

CANADA WARBLER Wilsonia canadensis June 1 (Uncommon)

First seen along the Mantagao River. Later in June, individuals were occasionally noted in a spruce stand near the Mantagao River. The species was not observed again until late August when several were noticed in a flock of mixed warblers.

AMERICAN REDSTART Setophaga ruticilla May 24 (Common)

Noted in large numbers in mid-May and early June along the Mantagao River and Mantagao Lake. They were regularly sighted throughout the study period.

BOBOLINK Dolichonyx oryzivorus May 24 (Uncommon)

The first observation was a male in a sedge meadow situated off Idlewild Road. In another large meadow located directly west of the Check Station, at least seven males were noted. Intensive searches for a nest proved unsuccessful. Bobolinks were seen until the third week of July.

WESTERN MEADOWLARK Sturnella neglecta July 30 (Rare)

A single meadowlark was sighted along the roadside near the south entrance on July 30.

YELLOW-HEADED BLACKBIRD Xanthocephalus xanthocephalus June 3 (Uncommon)

Not common. The first sighting was of two females seen in a stand of bulrush along Mantagao Lake. Individuals were occasionally noted along Idlewild road in early July.

RED-WINGED BLACKBIRD* Agelaius phoeniceus May 23 (Common)

Common in the cattail and bulrush marshes throughout the area. Ten nests were found during the study.

NORTHERN ORIOLE* Icterus galbula May 25 (Common)

Northern Orioles were common in aspen woods and in a wooded area along Mantagao Lake and the Mantagao River. A female was observed feeding three young along Mantagao Lake on July 19.

BREWER'S BLACKBIRD Euphagus cyanocephalus June 2 (Uncommon)

Sightings were made along the lake road and the southeast fire tower road.

COMMON GRACKLE Quiscalus quiscula June 1 (Common)

Noted throughout the management area but most common along the Mantagao River.

BROWN-HEADED COWBIRD* Molothrus ater May 23 (Abundant)

Observed in all habitat types. A large flock of approximately 75 individuals was seen feeding in a ploughed field near the south entrance to the management area in early June. A partial albino cowbird was sighted on

June 14 in a field next to a sedge meadow near the Check Station. This bird had a white head, throat and back with a brownish breast and tail. The bird was feeding with a flock of 15 other cowbirds. On August 1 an adult White-throated Sparrow was seen feeding a flightless young cowbird.

ROSE-BREASTED GROSBEAK* Pheucticus ludovicianus May 24 (Common)

Common in the aspen woods of the management area. A flightless young was found in the aspen bird plot on July 9.

PURPLE FINCH Carpodacus purpureus June 24 (Uncommon)

A male sighted along the Mantagao River on June 24 was the first record of the species. Although occasionally seen in July along the Mantagao Lake and the Mantagao River, no observations were made in August.

AMERICAN GOLDFINCH Carduelis tristis June 1 (Common)

Not seen in the area until June 1. They were conspicuous in late July and August feeding on thistle heads.

RED CROSSBILL Loxia leucoptera July 30 (Rare)

A small flock was seen in a jack pine stand along the southeast fire tower road.

RUFOUS-SIDED TOWHEE Pipilo erythrophthalmus May 24 (Uncommon)

A pair was noted regularly during the study in the spruce plantation. Another sighting took place in an open aspen stand along the southeast fire tower road in early July.

SAVANNAH SPARROW Passerculus sandwichensis May 24 (Common)

Common throughout the management area, especially along the edges of sedge meadows.

LE CONTE'S SPARROW Ammospiza leconteii June 13 (Uncommon)

Sightings were limited to the management area's sedge meadows.

VESPER SPARROW Pooecetes gramineus May 23 (Common)

Vesper Sparrows were common in open meadows which had burned earlier in the spring.

CHIPPING SPARROW Spizella passerina May 28 (Common)

Common throughout the area, especially in the spruce plantation, jack pine and mixed-woods forests.

CLAY-COLORED SPARROW* Spizella pallida May 23 (Common)

Common along roadsides, open aspen woods, in the spruce plantation and the edges of aspen forests. Two nests were found in the management area.

WHITE-THROATED SPARROW Zonotrichia albicollis May 23 (Abundant)

White-throated Sparrows were found in the aspen forests, mixed-wood forests and the spruce plantation.

SWAMP SPARROW Melospiza georgiana May 15 (Uncommon)

Occasionally noted along the Mantagao River and near streams and wet ditches with extensive willow growth.

SONG SPARROW* Melospiza melodia May 23 (Common)

Common in the spruce plantation, along the Mantagao River, Mantagao Lake and edges of clearings. An adult was observed feeding a flightless young in some hazel shrubs along Mantagao Lake in early August.

The following nine species were recorded immediately outside the boundaries of the management area:

SPRUCE GROUSE Canachites canadensis

Three individuals were observed by D. Collicutt in a stand of jack pine on August 13 near the northwest fire tower.

AMERICAN COOT Fulica americana

Individuals were seen throughout the summer in a marsh off Highway 325 one kilometer west of the management area's boundary.

ROCK DOVE Columba livia

Ten were observed on June 12 approximately three and one-half kilometers southeast of the Check Station.

HAWK OWL Surnia ulna

A Hawk Owl was noted in an aspen tree three and one-half kilometers southeast of the Check Station May 22.

RED-HEADED WOODPECKER Melanerpes erythrocephalus

On June 1 an adult flew across Highway 325 approximately eight kilometers southeast of the Check Station.

BLACK-BACKED THREE-TOED WOODPECKER Picoides arcitus

A female was observed near the northwest fire tower.

BANK SWALLOW Riparia riparia

A colony of Bank Swallows nested in a gravel pit 4 kilometers southeast of the Check Station.

PURPLE MARTIN *Progne subis*

Two were seen on August 14 at the northwest fire tower along Idlewild Road.

SOLITARY VIREO *Vireo solitarius*

A single adult Solitary Vireo was seen in a jack pine stand behind the northwest fire tower cabin on August 8.

Reptiles

Red-sided Garter Snake (Thamnophis sirtalis)

These snakes were commonly encountered throughout the area. Most sightings were made on roads or in aspen stands; but individuals were occasionally found in jack pine stands or bogs. Many specimens were caught and examined closely before release. Males tended to average 400-500 mm in length while the females ranged from 500-800 mm. On August 16, two pregnant females which had been run over on Highway 325 were found. One contained 15 young (some live and some dead) while the other had 17 young, not quite ready for birth (yolk sacs were still fairly large).

Plains Garter Snake (Thamnophis radix)

Only four specimens of this snake were encountered and all of these were in the southern part of the area (just outside the area for two of the sightings). One was seen in a large dry field along the southeastern border while the other three were found on Highway 325; two just west of the area and the other in the WMA. The habitat along Highway 325 is mostly small aspens and mixed white spruce-aspen forest with scattered sedge marshes. Dr. W. Preston (Manitoba Museum of Man and Nature) states that these specimens represent new northern records for plains garter snakes in the Interlake. Two of the specimens found dead on the road were donated to the museum collection.

Red- bellied Snake (Storeria occipitomaculata)

These snakes were commonly encountered on roads in aspen stands. They were never found in association with other tree communities. More than 20 specimens were caught and examined. The adults ranged in size from 16.5 - 26.5 cm. Color variation was great among those caught. Belly

color and back colors varied in intensity producing a shade and stripe pattern. Back colors ranged from almost black to reddish brown; most were grey. Intensity of the lateral and dorsal stripes varied with the individual; some were prominent while on others striping was only faint. On August 22 a pregnant female was run over. Examination revealed eight young inside her (four live and four dead). The young measured approximately 8.5 - 9.0 cm in length. Dr. W. Preston (Manitoba Museum of Man and Nature) has stated that these sightings represent new northern records for red-bellied snake collection.

Amphibians

Canadian Toad (*Bufo hemiophrys*)

These toads were common over most of the area. They were abundant along waterways and roadsides where ditches remained damp or water filled. They were seen in aspen stands far from open water and even occasionally in jack pine stands.

Grey Tree Frog (*Hyla versicolor*, *H. chrysoscelis*)

Only two tree frog specimens were found during the study. Both were in aspen forest in the eastern section of the area, south of the river. It was not determined which of the two species, *H. versicolor* or *H. chrysoscelis*, the specimens were. Dr. W. Preston of the Manitoba Museum of Man and Nature has stated that our sightings represent a new northern record for tree frogs in the Interlake.

Boreal Chorus Frog (*Pseudacris triseriata*)

Chorus frogs were abundant throughout the area. In late May and early June they could be found, or heard in large numbers by any small pool of water or along any area marsh or waterway. Calling had ceased by mid-June and sightings became less frequent after this time. Occasional sightings were made in damp fields and openings in spruce bogs throughout the field season.

Northern Leopard Frog (*Rana pipiens*)

Surprisingly only two leopard frogs were seen during the study period. Both were medium-sized adults and were sighted along the Mantagao River in grassy habitats.

Wood Frog (Rana sylvatica)

Wood frogs were very common in nearly all area habitats. They were recorded in spruce bogs, jack pines, aspens, sedge marshes and along waterways.

DISCUSSION AND CONCLUSIONS

Mantagao Lake WMA is an area of diverse habitats, abundant and varied wildlife (Dixon 1978).

The discovery of three northern records for animal species attests to the first priority described in the Management Plan (a need for plant and animal inventories).

This study provided an annotated list for animal species as well as information on species composition in various habitats and a species list for plants including flowering dates for many species.

The intent of this study was not to describe management programs nor was it to delineate the specific habitats utilized by big game animals. Studies on the aquatic animal fauna were not undertaken although, as stated in the Management Plan, considerable numbers of fishermen angle in Mantagao Lake and associated river. Fish represent a valuable resource to area wildlife species such as loons, ospreys and pelicans. The variability of community types and the homogeneous nature of size classes, especially among the aspen and jack pine stands was particularly noticeable in the WMA. A majority of the area was in a mid-successional stage. Large old trees were found sporadically except along waterways where they have been protected from fires. Fires have apparently removed whatever cover type was climax for the region, and left a patchwork of age classes among the regenerating communities. It is this patchwork of communities which has provided habitat for the vast numbers of species presently living in the WMA. As the successional stages advance, species such as elk and deer will gradually reduce their numbers, despite the fact the area was originally set aside for the management of these ungulate species.

Roads in Mantagao Lake WMA follow the high dry gravel ridges where

the dominant vegetation is aspen and jack pine. A glance at a forest inventory map or short trip off the road system reveals that bogs, marshes and fens dominate much of the area. One-third of the area is covered in black spruce, muskeg and sedge meadow communities. How these wet and dry habitats intermesh is important for area management, especially for big game.

Local topography and drainage factors play major roles in determining present plant communities in the Mantagao area. Large bogs and fens serve as reservoirs for water. The role of beaver in maintaining these bogs, string bogs and fens, essential for sandhill crane nesting, is significant.

Mantagao Lake itself is nearly surrounded by a pressure ridge some two meters high. This ridge, plus the rocky shoreline, effectively precludes marsh-like vegetation normally found along the edges of shallow lakes. Because of the sparse growth or general lack of bulrushes and cattails around Mantagao Lake, the area is little used by breeding waterfowl in abundance in the Mantagao River's upper reaches and in other lakes such as Cruisier and Pearl as well as in a number of area borrow pits. These bodies support large numbers of breeding waterfowl. Extensive human activity along the river and around smaller Mantagao lakes will be disruptive to those nesting waterfowl.

Plant communities around Mantagao Lake and River are diverse and unique in the area. While aspen, jack pine and black spruce communities predominate over most of the WMA they are replaced along this lake and river shoreline by American elm, green ash, bur oak, paper birch and balsam poplar. This strip, usually only 10-20 m wide, of broad-leaved trees, reflects a community common to much more southerly waterways.

Mantagao Lake Wildlife Management Area contains the core habitat for Manitoba's only remaining wild elk herd east of Lake Manitoba. This

feature was a major consideration in establishing the WMA and warrants careful consideration in future development plans for the area. When considering the somewhat unique and highly varied flora and fauna of Mantagao Lake WMA it is essential to remember that historic disturbance by fire has been a regular occurrence. This feature has maintained large areas in pioneer successional stages including openings and early shrub stages. These openings are essential for elk survival in the area while early shrub stages enhance the area's deer potential. Management to maintain Mantagao's floral and faunal diversity will require disturbance to provide essential habitat for elk and deer. Moose populations have made large increases since the area's season was closed in the early 1970's. Although this increase from 20 to 150 has been attributed to less hunting pressure it also reflects the maturing nature of the floral community which has brought about a reduction and outward migration in elk populations.

The composition of habitats and species incidence is constantly changing in all but the most stable of habitats. In the Mantagao area where succession is rapidly occurring these changes are particularly obvious.

Plant and animal species will flourish, within their ranges, as long as habitat is suitable for their survival there.

If Mantagao WMA is to be managed, as stated in the Management Plan, for 400-500 elk and 800-1200 deer, as well as to improve habitats for sharp-tailed grouse and maintain a general species diversity, then steps must be outlined to regularly alter vegetative cover in the area.

An important management contrast is in the management for the Plan's objective to increase populations of sandhill cranes, moose and ruffed grouse, the former requiring more advanced successional stages of habitat for maximum densities.

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Appendix Ia

Results from five Mantagao Lake WMA Jack Pine Plots.

A. Tree species	Av. Freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area A	B	C	D	E	Rel. dom.	Av. Ht. (m)
1. Jack Pine	98.1	1	6	18	4	1	29	0.01	.25	2.21	.96	.09	99.7	13.6
2. White Spruce	0.6	1					0.2						0.05	2.4
3. Choke Cherry	0.6	1					0.2						0.05	3.0
4. Trembling Aspen	0.7		1				0.2		0.2				0.23	10.7
5.														

B. Shrub species	stems/20m^2		Shrub species	stems/20m^2
1. Willow sp.	1.2	6.	Buffaloberry	0.4
2. Dwarf Birch	1.2	7.		
3. Beaked Hazel	2.0	8.		
4. Choke Cherry	0.2	9.		
5. Trembling Aspen	0.2	10.		

C. Average canopy cover in % 53
Average ground cover in % 64

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Litter	2.28	4	100 %
2. Bunchberry	1.72	5	96
3. Strawberry	0.88	4	75
4. Unidentified	0.88	3	64
5. Dewberry	0.84	3	88
6. Rose spp.	0.76	3	64
7. Twinflower	0.88	5	80
8. Snowberry	0.64	2	64
9. Grass	0.60	2	52
10. Moss	1.40	6	76
11. Dwarf Birch	0.32	3	32
12. Beaked Hazel	0.28	2	28
13. Northern Bedstraw	0.24	1	72
14. Shrubby Cinquefoil	0.20	3	24
15. Spreading Dogbane	0.24	3	28
16. Buffaloberry	0.16	3	8
17. Balsam Poplar	0.12	2	14
18. Wintergreen	0.16	1	32
19. Saskatoon	0.12	2	12
20. Bearberry	0.08	1	14
21. Pea sp.	0.04	1	20
22. Dandelion	.05	0	56
23. Purple Vetch	.05	0	12
24. Pincherry	0.08	1	8
25. Wild lily of the Valley	.05	1	12
26. Poison Ivy	.05	1	4
27. Early Meadow-Rue	.05	1	8
28.			
29.			
30.			

Appendix Ib

B Ground Cover in five Mantagao Lake Dry Meadow Plots, 1979.

Species	Average cover class	Class range	% occurence
1. Grass	2.2	1-3	100
2. Bearberry	1.6	1-3	100
3. Saskatoon	1.6	1-2	100
4. Litter	1.6	1-2	100
5. Unidentified	1.0	0-1	100
6. Northern Bedstraw	0.8	0-2	100
7. Canada Anemone	0.4	-1	60
8. Goldenrod	0.1	-0	60
9. Hoary Puccoon	0.1	-1	60
10. Milk Vetch sp.	0.1	-1	40
11. Meadow Blazing Star	0.1	-1	40
12. Yarrow	0.1	-1	40
13. Snowberry	0.1	-1	20
14. Lichen	0.1	-1	20
15. Seneca Root	0.1	-0	20
16. Harebells	0.1	-0	20
17. Thistle sp.	0.1	-0	20

Appendix Ic

Vegetative Cover in five Mantagao Lake Dry Meadow Boarder Plots, 1979.

A. Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq m	Average basal area ($cm^2/100\ m^2$) A	B	C	D	E	Rel. dom.	Av. ht. (m)
1. Trembling Aspen	100		27	3			30		1.16	.36			100	7.6
2.														
3.														
4.														
5.														

B. Shrub species	stems/$20m^2$	Shrub species	stems/$20m^2$
1. Choke Cherry	7	6.	
2. Downy Arrow-wood	2	7.	
3.		8.	
4.		9.	
5.		10.	

C. Average canopy cover in % 50
Average ground cover in % 75

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Bearberry	2.0	2	100 %
2. Rose sp.	1.2	2	100
3. Goldenrod	1.0	2	100
4. Unidentified	1.2	2	100
5. Litter	1.2	2	100
6. Northern Bedstraw	0.4	1	100
7. Early Meadow-Rue	0.6	1	100
8. Vetch sp.	1.0	2	80
9. Saskatoon	0.6	1	80
10. Grass sp.	1.0	2	80
11. Snowberry	0.8	1	80
12. Buffaloberry	1.2	2	80
13. Trembling Aspen	0.6	1	80
14. Yarrow	0.2	1	60
15. Wild Lily of the Valley	0.4	1	60
16. American Hazel	0.4	1	40
17. Comandra	0.1	1	20
18.			
19.			
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Appendix Id

Mantagao Lake-Side Vegetation Plot Results from 1979.

A.	Tree species	Av. freq.	DBH class B	C	D	E	F	Av. trees/ 100 sq. m.	Average basal area ($cm^2/100\ m^2$) B	C	D	E	F	Rel. dom.	Av ht. (m)
1.	Trembling Aspen	55	1.5		1.5	2	.5	5.5	0.07		.36	.96	.62	57	12.2
2.	Green Ash	36	1	2.5	.5			4	.05	.3	1.2			16	9.9
3.	White Birch	6				.5		0.5					.24	7	11.2
4.	Bur Oak	4					.5	0.5					.62	21	12.2
5.															

B.	Shrub Species	stems/$20m^2$	Shrub species	stems/$20m^2$
1.	Trembling Aspen	1	6.	
2.	Green Ash	1	7.	
3.	Willow sp.	1	8.	
4.	Raspberry	1	9.	
5.			10.	

C. Average canopy cover in % 68
Average ground cover in % 70

D.	Ground cover species	Average cover	Max. cover class	Frequency
1.	Grass	2.8	4	100 %
2.	Dandelion	1.3	3	90
3.	Litter	1.9	3	100
4.	Unidentified	1.9	3	100
5.	Strawberry	1.1	3	90
6.	Black Current	0.6	2	60
7.	Thistle sp.	0.3	1	50
8.	Early Meadow-Rue	0.3	1	50
9.	Red Osier Dogwood	0.4	2	30
10.	Sweet-scented Bedstraw	0.3	1	40
11.	False Solomon's Seal	0.3	1	30
12.	Moss sp.	0.1	0	20
13.	Poison Ivy	0.1	1	10
14.	Bunchberry	0.1	1	10
15.	Northern Bedstraw	0.1	1	10
16.	Trembling Aspen	0.1	1	10
17.	Fireweed	0.1	1	10
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Appendix Ie

Lake Ridge Plot, Mantagao Lake Campground August 16, 1979.

A.	Tree species	Av. freq.	DBH class B	C	D	E	F	Av. trees/ 100 sq. m.	Average basal area ($cm^2/100m^2$) B	C	D	E	F	Rel. dom.	Av. ht.
1.	Balsam Poplar	76	9	7	4	2		22	.39	.84	.96	.96		41	10.7
2.	Bur Oak	14			1	1	2	4			.24	.48	2.48	41	10.7
3.	Green Ash	7				2		2				.96		12	10.7
4.	White Birch	3				1		1				.48		.6	10.7
5.															

B.	Shrub species	stems/$20m^2$	Shrub species	stems/$20m^2$
1.			6.	
2.			7.	
3.	No shrubs were recorded at 1.3 m.		8.	
4.			9.	
5.			10.	

C. Average canopy cover in %
Average ground cover in % Not tabulated

D.	Ground cover species	Average cover	Max. cover class	Frequency
1.	Grass	2.75	6	100 %
2.	Litter	2.4	6	100
3.	Sow thistle	0.37	1	50
4.	Canada Thistle	0.25	1	37
5.	Snowberry	1.75	6	62
6.	Rose sp.	0.25	1	25
7.	Poison Ivy	0.37	3	12
8.	Northern Bedstraw	0.25	2	12
9.	Raspberry	0.12	1	12
10.	Vetch sp.	0.12	1	12
11.	Yarrow	0.12	1	12
12.	Yellow Sweet Clover	0.1	0	12
13.	Bur Oak	0.1	0	12
14.	White Clover	0.1	0	12
15.				
16.				
17.				
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Appendix If

Three Bog Plots combined along Idlewilde Road, August 9, 1979.

A. Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area ($cm^2/100\ m^2$) A	B	C	D	E	Rel. dom.	Av. ht. (m)
1. Black Spruce	100	4	9	3	2		18	.03	.32	.32	.3		100	9.6
2.														
3.														
4.														
5.														

B. Shrub species	stems/$20m^2$	Shrub species	stems/ $20m^2$
1. Black Spruce	1	6.	
2. Speckled Alder	3	7.	
3. Willow sp.	1	8.	
4. Black Poplar	-	9.	
5.		10.	

C. Average canopy cover in % 15
Average ground cover in % 40

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Mosses	2.75	6	100 %
2. Horsetail	0.65	2	75
3. Laborador Tea	0.65	2	60
4. Sedge	1.3	5	75
5. Shrubby Cinquefoil	0.9	4	60
6. Unidentified	0.6	1	95
7. Dwarf Birch	0.7	2	60
8. Black Spruce	0.35	3	35
9. Litter	0.25	3	50
10. Twinflower	0.25	2	45
11. Honeysuckle	0.25	3	10
12. Red Osier Dogwood	0.15	2	15
13. Bog Cranberry	0.15	2	50
14. Juniper	0.15	3	10
15. Bog Rosemary	0.15	2	10
16. Speckled Alder	0.1	1	30
17. Pitcher plant	0.1	1	10
18. Fireweed	0.1	0	20
19. Grass	0.1	0	20
20. Star Flower	0.1	0	25
21. Sweet-scented Bedstraw	0.1	0	20
22. Dewberry	0.1	1	15
23. Bunchberry	0.1	1	10
24. Snowberry	0.1	1	5
25. Tamarack	0.1	1	5
26. Arrow Grass	0.1	0	5
27. Brook Lobelia	0.1	0	5
28.			
29.			
30.			

Appendix Ig

Mantagao Lake Road Young Aspen Stand, August 22, 1979.

A. Tree species	Av. Freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area ($cm^2/100m^2$) A	B	C	D	E	Rel. dom.	Av. ht.
1. Trembling Aspen	100	34	23				57	.32	.99				100	6.1
2.														
3.														
4.														
5.														

B. Shrub species	stems/$20m^2$	Shrub species	stems/$20m^2$
1. Chokecherry	3	6.	
2. Willow sp.	2	7.	
3.		8.	
4.		9.	
5.		10.	

C. Average canopy cover in % 40
Average ground cover in % 80

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Pea Vine	1.8	2	100
2. Litter	1.4	2	100
3. Rose sp.	1.4	2	100
4. Grass	1.4	2	100
5. Spreading Dogbane	1.4	2	80
6. Buffaloberry	1.0	2	80
7. Unidentified	1.0	1	100
8. Strawberry	0.8	2	60
9. Northern Bedstraw	0.6	1	80
10. Chokecherry	0.8	2	60
11. Saskatoon	0.6	1	60
12. Sow thistle	0.4	1	60
13. Blue Aster	0.2	1	60
14. Canada Anemone	0.2	1	60
15. Fireweed	0.2	1	40
16. Western Red Lily	0.1	0	20
17.			
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Appendix Ih

Mantagao Lake Road Aspen, Jack Pine Stand, August 22, 1979.

A. Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area ($cm^2/100\ m^2$) A	B	C	D	E	Rel. dom.	Av. ht. (m)
1. Trembling Aspen	45	1	12				13	.009	.52				46	9.1
2. Jack Pine	52	3	11	1			15	.03	.47	.12			54	9.7
3. Bur Oak	3	1					1	.009					-	2.7
4.														
5.														

B. Shrub species	stems/20 m^2	Shrub species	stems/20 m^2
1.		6.	
2.		7.	
3. No shrubs at 1.3 meters.		8.	
4.		9.	
5.		10.	

C. Average canopy cover in % 30
Average ground cover in % 55

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Bearberry	2	3	100
2. Litter	2	2	100
3. Moss sp.	1.6	2	100
4. Twinflower	1.4	2	100
5. Unidentified	1.2	2	100
6. Pea Vine	0.8	2	60
7. Northern Bedstraw	0.4	1	80
8. Strawberry	0.4	1	60
9. Soapberry	0.4	1	40
10. Beaked Hazel	0.4	1	40
11. Chokecherry	0.2	1	60
12. Grass sp.	0.2	1	60
13. Snowberry	0.2	1	60
14. Hoary Puccoon	0.2	1	40
15. Black Spruce	0.2	1	20
16. Beggar's Tick	< 0.1	0	20
17.			
18.			
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Appendix Ii

Mantagao Lake Road Aspen Stand, August 22, 1979.

A.	Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees 100 sq. m.	Average Basal area ($cm^2/100m^2$) A	B	C	D	E	Rel. dom.	Av. ht.
1.	Trembling Aspen	100	5	30				35	.05	1.29				100	8.2
2.															
3.															
4.															
5.															

B.	Shrub species	stems/$20m^2$	Shrub species	stems/$20m^2$
1.			6.	
2.			7.	
3.	No shrubs at 1.3 meters.		8.	
4.			9.	
5.			10.	

C. Average canopy cover in % 30
Average ground cover in % 60

D.	Ground cover species	Average cover	Max. cover class	Frequency
1.	Litter	2	2	100
2.	Beaked Hazel	1.4	3	80
3.	Early Meadow-Rue	1.4	2	80
4.	Northern Bedstraw	1	1	100
5.	Rose sp.	1.2	2	80
6.	Unidentified	1	1	100
7.	Pea Vine	0.8	2	80
8.	Fireweed	0.6	1	80
9.	Dandelion	0.4	1	80
10.	Strawberry	0.4	1	40
11.	Sowthistle	0.2	1	60
12.	Northern Gooseberry	0.2	1	40
13.	Canada Anemone	0.2	1	40
14.	Goldenrod	0.2	1	40
15.	White Aster	0.2	1	40
16.	Blue Aster	0.2	1	40
17.				
18.				
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Appendix Ij

Mantagao Lake Road White Spruce, Aspen Stand, August 22, 1979

A. Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area ($cm^2/100m^2$) A	B	C	D	E	Rel. dom.	Av. ht.
1. Trembling Aspen	60	2	9	1			12	.02	.39	.12			65	9.1
2. White Spruce	40	2	6				8	.02	.20				35	7.6
3.														
4.														
5.														

B. Shrub species	stems/$20m^2$	Shrub species	stems/$20m^2$
1. Trembling Aspen	1	6.	
2. Buffaloberry	2	7.	
3.		8.	
4.		9.	
5.		10.	

C. Average canopy cover in % 15
Average ground cover in % 30

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Litter	2.1	3	100
2. Bearberry	2	2	100
3. Unidentified	2	4	100
4. Strawberry	0.6	1	80
5. Buffaloberry	0.6	2	60
6. Bunchberry	0.6	1	60
7. Spreading Dogbane	0.6	2	40
8. Northern Bedstraw	0.2	1	60
9. Milk Vetch	0.2	1	60
10. Grass sp.	0.2	0	100
11. Moss sp.	0.2	1	40
12. Dandelion	0.2	1	40
13.			
14.			
15.			
16.			
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Appendix Ik

Mantagao Lake Road Mixed Stand, August 22, 1979

A. Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area ($cm^2/100\ m^2$) A	B	C	D	E	Rel. dom.	Av. ht. (m)
1. Trembling Aspen	22	1	3				4	.009	.13			7	7	15.3
2. Tamarack	21		1	1			2		.043	.12		9	9	9.1
3. Black Spruce	33		6				6		.26			14	14	9.1
4. White Spruce	17			2		1	3			.24	.2	.48	38	12.2
5. Jack Pine	17			1	2		3			.12	.48		32	7.6

B. Shrub species	stems/20 m^2	Shrub species	stems/20 m^2
1. Dwarf Birch	12	6.	
2. Willow sp.	6	7.	
3. Honeysuckle	2	8.	
4.		9.	
5.		10.	

C. Average canopy cover in % 50
Average ground cover in % 50

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Litter	2.1	3	100
2. Moss sp.	1	2	100
3. Bunchberry	1.4	2	100
4. Twinflower	1	1	100
5. Unidentified	1	1	100
6. Buffaloberry	0.8	2	80
7. Dwarf Birch	1	2	80
8. Shrubby Cinquefoil	0.8	2	60
9. Early Meadow-Rue	0.6	1	60
10. Rose sp.	0.4	1	60
11. Grass sp.	0.4	1	80
12. Gooseberry	0.4	1	40
13. Spreading Dogbane	0.4	1	60
14. Strawberry	0.2	1	60
15.			
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Appendix II

Ten plots done in mature aspen in Southeastern Manatagao W.M.A., July 19, 1979.

A. Tree species	Av. freq.	DBH class A	B	C	D	E	Av. trees/ 100 sq. m.	Average Basal area ($cm^2/100\ m^2$) A	B	C	D	E	Rel. dom.	Av. ht. (m)
1. Trembling Aspen	100	.7	7.2	4.5	1.9	0.1	14.4	.007	.31	.54	.46	.048		10.8
2.														
3.														
4.														
5.														

B. Shrub species	stems/20 m^2	Shrub species	stems/20 m^2
1. Hazel	17.3	6. Pincherry	1.2
2. Saskatoon	9.6	7. Trembling Aspen	0.9
3. Chokecherry	8.2	8. Wild Plum	0.8
4. Downy Arrow-wood	6.8	9. Hawthorn	0.5
5. Willow	1.4	10. Rose Sp.	0.1
		11. Honeysuckle	0.1

C. Average canopy cover in % 56
Average ground cover in % 79

D. Ground cover species	Average cover	Max. cover class	Frequency
1. Grass Sp.	2.1	2	100
2. Sarsaparilla	0.6	2	100
3. Unidentified	1.0	2.1	100
4. Litter	1.2	2	100
5. Rose Sp.	0.6	1	90
6. Dandelion	0.5	1	90
7. Chokecherry	0.2	1	90
8. Strawberry	0.5	1	90
9. Beaked Hazel	0.7	2	70
10. Snowberry	0.3	1	80
11. Saskatoon	0.2	1	80
12. Raspberry	0.4	1	60
13. Fireweed	0.2	1	90
14. Early Meadow-rue	0.2	1	90
15. Northern Bedstraw	0.1	1	80
16. Vetch Sp.	0.4	2	50
17. Pea Vine	0.3	1	50
18. Goldenrod Sp.	0.2	1	50
19. Wild Lily of the Valley	$\leq$ 0.1	0	40
20. Downy Arrow-wood	0.1	1	30
21. Pincherry	0.1	1	30
22. Hoary Puccoon	$\leq$ 0.1	1	10
23. Bearberry	$\leq$ 0.1	1	10
24. Trembling Aspen	$\leq$ 0.1	0	20
25. Yarrow	$\leq$ 0.1	0	20
26. Gooseberry	$\leq$ 0.1	0	20
27. Beggar's Tick	$\leq$ 0.1	0	20
28. Cow Parsnip	0.1	1	30
29. Honeysuckle	$\leq$ 0.1	0	20
30. Spreading Dogbane	0.1	1	20
31. Balsam Poplar	$\leq$ 0.1	0	20
32. Pigweed	$\leq$ 0.1	0	10
33. Willow Sp.	$\leq$ 0.1	0	10
34. Fringed Loosestrife	$\leq$ 0.1	0	10
35. Yellow Mandarin	$\leq$ 0.1	0	20
36. Short Stem Thistle	$\leq$ 0.1	0	10
37. Wild Plum	$\leq$ 0.1	0	10
38. Moss Sp.	$\leq$ 0.1	0	10
39. Harebells	$\leq$ 0.1	0	10

Appendix II (from: American Birds)

ASPEN FOREST.-Location: Manitoba; Mantagao Wildlife Management Area, 7.7 miles northwest of the junction of provincial road 325 and south Mantagao Lake road, 51°17'N, 97°58'W, Hecla 62P/4. Continuity: New. Size: 16 ha. (Populus tremuloides). Beaked Hazel (Corylus cornuta), Saskatoon (Amelanchier alnifolia), Raspberry (Rubus strigosus), Rose (Rosa spp.) and Snowberry (Symphoricarpos occidentalis). The ground cover was composed largely of various grasses and vetches with Sarsaparilla (Aralia nudicaulis) and Strawberry (Fragaria spp.), the most common individual species. A quantitative survey of ten vegetation plots (10 m x 10 m each) gave the following results for trees: 582/acre: total basal area 552 cm^2/acre. Trembling aspen was the only tree species encountered. Trees by diameter size class: A(2-5 cm) 28,7, 5,30; B (5-10 cm) 292,72,23,80; C (10-15 cm) 183,45,40,90; D (15-20 cm) 77,19, 34,50; E (20-30 cm) 4,1,3,10. Shrub stems/acre 1899; ground cover 78.9%; canopy cover 55.5%; average canopy height 33.5 ft. Edge: bordered on all sides by similar habitat. Several small meadows are located in the southeast corner and central portion of the plot. Topography: Flat. Elevation: Approximately 875 ft. Weather: Basically clear and warm. Coverage: June 4, 7,15,17,25,26,29, July 6; 05;00-08:30. Total man hours: 20. Census: Least Flycatcher, 12 (75,30); Red-eyed Vireo, 6 (38,15); Ovenbird, 3 (19,8); House Wren, 3; Mourning Warbler, 3; Great Crested Flycatcher, (2); Clay-colored Sparrow, (2); Black-capped Chickadee, (1); Rose-breasted Grosbeak, (1); Tennessee Warbler, (1); Veery, (1); Philadelphia Vireo, (1); White-throated Sparrow, (1); Northern Oriole, +. Total: 14 species; 37 territorial males (231/km^2, 94/100 acres). Visitors: Chestnut-sided Warbler, Cedar Waxwing, Blue Jay, Brownheaded Cowbird, Tree Swallow, American Goldfinch. Remarks: Two nests were found: Veery, Great Crested Flycatcher. A flightless Rose-breasted Grosbeak was found in the plot. NICHOLAS J. FOY.

Appendix III

Details of Breeding Bird Road Counts ("Stops were made every kilometer")

	Road Count			
	Date	Time Started	Location	No. Kilometers Covered
1	June 3	7:15	lake road	5
2	June 5	5:30	river road	10
3	June 19	5:15	southeast fire tower road	6
4	June 19	6:20	river road	15
5	June 27	6:25	ldlewild Road to northern boundary of area	19
6	July 5	5:15	lake road	16

x= No. of stops where the species was recorded

y= Total number of birds of this species recorded

Road Counts

	1	2	3	4	5	6
Common Loon	-	-	-	-	-	1/1
Pied-billed Grebe	-	-	-	-	1/1	1/1
American Bittern	-	1/1	-	-	-	-
Mallard	-	-	-	1/1	-	-
American Wigeon	-	-	-	1/2	-	-
Broad-winged Hawk	-	-	-	-	1/1	-
Red-tailed Hawk	-	-	1/1	-	-	-
Marsh Hawk	-	-	1/1	-	-	1/1
Ruffed Grouse	2/2	2/2	-	1/1	-	-
Sandhill Crane	1/4	1/1	-	1/1	1/1	-
Sora	-	-	-	-	1/1	1/1
Killdeer	-	-	-	1/2	-	-
Spotted Sandpiper	-	-	-	1/2	-	-
Common Snipe	2/2	-	-	-	5/5	1/1
Black Tern	-	-	-	-	1/4	-
Mourning Dove	1/1	8/8	5/7	4/5	2/2	4/4
Black-billed Cuckoo	-	-	-	-	1/1	-
Great Horned Owl	-	-	-	1/2	-	-
Common Flicker	1/1	-	-	-	2/2	2/2
Downy Woodpecker	-	-	-	-	-	1/1
Hairy Woodpecker	-	-	-	1/1	-	-
Eastern Kingbird	-	-	-	-	1/2	-
Great Crested Flycatcher	1/1	1/1	-	-	-	3/3
Eastern Phoebe	1/1	-	1/2	-	-	-

	1	2	3	4	5	6
Alder Flycatcher	-	-	-	-	3/3	-
Least Flycatcher	3/4	3/5	1/1	5/5	2/2	2/2
Olive-sided Flycatcher	-	-	-	-	1/1	-
Tree Swallow	-	-	1/2	-	-	-
Barn Swallow	-	-	1/6	-	-	-
Eastern Wood Pewee	-	-	-	-	1/1	-
Blue Jay	-	1/2	1/1	2/3	1/1	2/2
Common Raven	-	-	2/2	-	3/3	2/2
Common Crow	2/3	5/6	1/1	3/3	1/1	1/1
Black-capped Chickadee	-	-	-	-	2/2	-
House Wren	-	-	-	-	1/1	-
Short-billed Marsh Wren	-	-	-	-	3/3	-
Gray Catbird	2/2	-	-	-	1/2	-
Brown Thrasher	-	1/1	-	-	-	-
Hermit Thrush	1/1	3/3	3/3	6/7	4/4	7/7
Swainson's Thrush	-	-	1/1	-	-	-
Veery	-	-	-	1/1	-	1/1
Ruby-crowned Kinglet	-	1/1	-	-	2/2	-
Red-eyed Vireo	-	-	2/2	7/12	8/10	6/6
Black-and-white Warbler	-	-	-	-	1/1	-
Tennessee Warbler	-	3/3	1/1	2/2	4/4	5/6
Nashville Warbler	2/2	1/1	-	4/4	5/5	2/2
Yellow Warbler	-	-	-	-	-	1/1
Cape May Warbler	-	-	-	-	2/2	-
Chestnut-sided Warbler	1/1	1/1	-	1/1	3/3	1/1

	1	2	3	4	5	6
Ovenbird	3/5	4/4	1/1	7/10	4/6	6/6
Connecticut Warbler	2/2	7/10	1/1	7/7	3/3	4/4
Mourning Warbler	-	1/1	2/2	1/1	1/1	-
Common Yellow throat	-	-	-	3/3	5/5	4/4
Wilson's Warbler	1/1	-	-	-	-	-
American Redstart	-	-	-	-	1/1	-
Northern Oriole	-	1/1	-	2/2	-	-
Brewer's Blackbird	-	-	-	-	-	1/5
Red-winged Blackbird	-	1/3	1/3	-	6/10	2/2
Brown-headed Cowbird	2/5	2/2	3/7	1/1	3/3	4/6
Rose-breasted Grosbeak	1/2	1/1	-	3/3	3/4	-
American Goldfinch	1/6	3/10	-	-	-	-
Rufous-sided Towhee	-	-	-	1/1	-	-
Savannah Sparrow	-	-	-	-	-	1/1
Vesper Sparrow	1/1	-	-	-	-	1/2
Chipping Sparrow	-	3/3	2/5	4/6	5/5	1/1
Clay-colored Sparrow	3/3	4/4	6/6	5/5	4/6	6/6
White-throated Sparrow	1/1	5/7	-	3/3	9/12	5/5
Song Sparrow	2/2	1/1	3/3	4/4	1/1	3/3
American Robin	-	-	5/7	1/1	1/1	-
Total No. Stops For Each Survey	5	10	6	15	19	16

Total No. Species - 69

Appendix IV

Selected Waterfowl Breeding Pair Counts in the Mantagao Wildlife Management Area (including brood counts).

Cattail Marsh and Pond

June 1- 1 male Ruddy Duck, 1 male Mallard, 5 pairs Ring-necked Ducks

July 3- 3 lone male Ring-necked Ducks, 1 female Mallard

Pearl Lake

June 18- 6 adult Canada Geese, 2 pairs of these geese had a brood of 6 each, 5 pairs White-winged Scoters, 2 Pairs Ring-necked Ducks, group of 11 male Ring-necks flew up together, 1 pair Lesser Scaup, 5 lone male Lesser Scaups, 2 lone Ruddy Ducks, 1 male Green-winged Teal, 1 male Bufflehead, 1 Blue-winged Teal, 2 lone female American Goldeneye

Mantagao Lake

May 24- 12 Canada Geese, 2 pair Blue-winged Teal, 1 pair American Wigeon

June 2- 1 pair Canvasback, 1 pair Mallard

June 3- 1 pair White-winged Scoter, 2 lone male Blue-winged Teal, 2 lone male American Wigeon, 1 female Canvasback, 2 pairs Mallard

July 25- 2 lone male Wood Ducks, 1 female Mallard and 3 young

August 13-7 Canada Geese, 1 pair Canvasback

Mantagao River to Mouth

June 28- 1 female Wigeon and 6 young, 1 female Bufflehead and 8 young, 3 female American Goldeneye with 3 broods of 3,6,5, young, 1

female Malard and 6 young, 1 pair Wood Ducks, 1 male lesser Scaup, 1 male Mallard, 1 male Blue-winged Teal, 5 lone female Goldeneye with no broods, 1 male American Goldeneye, 1 female Gadwall, 1 pair American widgeon, 1 male American wigeon.

Borrow Pits along Highway 325- that follow the Management Area.

May 23- 5 pairs Ring-necked Ducks, 1 pair Canvasback

June 2- 5 pairs Ring-necked Ducks, 2 pairs Mallards

June 4- 5 pairs Ringed-necked Ducks, 1 female Redhead

June 26- 1 female Mallard and 10 young

July 17- 1 female Blue-winged Teal and 1 young, 6 juvenile Mallards, 1 female Ringed-necked Duck

Cruiser Lake

July 31- 1 female White-winged Scoter and 8 young, 1 female American Goldeneye, 2 juvenile Mallards (group),1 female Mallard, 1 male Canvasback, 2 lone male Lesser Scaups, 1 male Bufflehead and 10 unidentified ducks

Beaver Pond along West Lake Road

June 15- 1 female American Goldeneye and 10 young, 3 male Blue-winged Teal (group), 1 American Goldeneye, 1 male Blue-winged Teal, 1 male American Wigeon

August 14- 4 juvenile Mallards, 1 male Blue-winged Teal